PCT WORLD INTELLECTUAL PROPERTY ORGANIZATION
International Bureau

INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification 7 : H04L 29/00 — A2

(11) International Publication Number: **WO 00/69143**

(43) International Publication Date: 16 November 2000 (16.11.00)

(21) International Application Number: PCT/US00/12908

(22) International Filing Date: 11 May 2000 (11.05.00)

(30) Priority Data:
09/309,963 11 May 1999 (11.05.99) US

(71) Applicant *(for all designated States except US)*: VISITALK.COM, INC. [US/US]; 6135 North 7th Street, Phoenix, AZ 85014 (US).

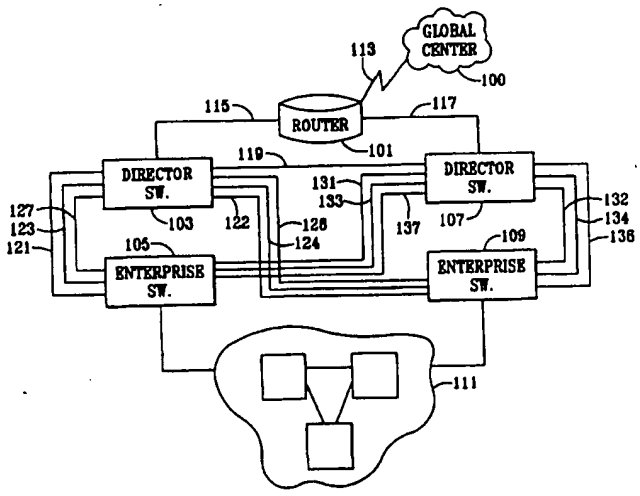
(72) Inventor; and
(75) Inventor/Applicant *(for US only)*: THIMMESCH, Peter [US/US]; 6135 North 7th Street, Phoenix, AZ 85014 (US).

(74) Agents: VANDERLAAN, Christopher, A. et al.; Lyon & Lyon LLP, 633 West Fifth Street, Suite 4700, Los Angeles, CA 90071 (US).

(81) Designated States: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).

Published
Without international search report and to be republished upon receipt of that report.

(54) Title: SYSTEM AND METHOD FOR FACILITATING COMMUNICATIONS OVER A DISTRIBUTED ELECTRONIC NETWORK



(57) Abstract

A system and method for facilitating communication over a global electronic network (e.g., the Internet) comprises a web site having a dynamic directory which stores the on–line status of registered users of the Internet, along with permanent communication numbers and current IP addresses for each registered user. A user seeking to establish communication with another registered user enters the target user's permanent communication number. If the target user is on–line, the requesting user receives the target user's current IP address from the directory, and instant or live communication then ensues. In the event that the target user is not on–line, the system will route the requesting user's message to video or voice mail for the target user. When the target user eventually comes on–line, the target user can retrieve messages from his or her mailbox. In one aspect, a system and method are provided for allowing either live or delayed communication to occur between users based upon whether the target user is on–line or off–line.

FOR THE PURPOSES OF INFORMATION ONLY

Codes used to identify States party to the PCT on the front pages of pamphlets publishing international applications under the PCT.

AL	Albania	**ES**	Spain	**LS**	Lesotho	**SI**	Slovenia
AM	Armenia	**FI**	Finland	**LT**	Lithuania	**SK**	Slovakia
AT	Austria	**FR**	France	**LU**	Luxembourg	**SN**	Senegal
AU	Australia	**GA**	Gabon	**LV**	Latvia	**SZ**	Swaziland
AZ	Azerbaijan	**GB**	United Kingdom	**MC**	Monaco	**TD**	Chad
BA	Bosnia and Herzegovina	**GE**	Georgia	**MD**	Republic of Moldova	**TG**	Togo
BB	Barbados	**GH**	Ghana	**MG**	Madagascar	**TJ**	Tajikistan
BE	Belgium	**GN**	Guinea	**MK**	The former Yugoslav Republic of Macedonia	**TM**	Turkmenistan
BF	Burkina Faso	**GR**	Greece			**TR**	Turkey
BG	Bulgaria	**HU**	Hungary	**ML**	Mali	**TT**	Trinidad and Tobago
BJ	Benin	**IE**	Ireland	**MN**	Mongolia	**UA**	Ukraine
BR	Brazil	**IL**	Israel	**MR**	Mauritania	**UG**	Uganda
BY	Belarus	**IS**	Iceland	**MW**	Malawi	**US**	United States of America
CA	Canada	**IT**	Italy	**MX**	Mexico	**UZ**	Uzbekistan
CF	Central African Republic	**JP**	Japan	**NE**	Niger	**VN**	Viet Nam
CG	Congo	**KE**	Kenya	**NL**	Netherlands	**YU**	Yugoslavia
CH	Switzerland	**KG**	Kyrgyzstan	**NO**	Norway	**ZW**	Zimbabwe
CI	Côte d'Ivoire	**KP**	Democratic People's Republic of Korea	**NZ**	New Zealand		
CM	Cameroon			**PL**	Poland		
CN	China	**KR**	Republic of Korea	**PT**	Portugal		
CU	Cuba	**KZ**	Kazakstan	**RO**	Romania		
CZ	Czech Republic	**LC**	Saint Lucia	**RU**	Russian Federation		
DE	Germany	**LI**	Liechtenstein	**SD**	Sudan		
DK	Denmark	**LK**	Sri Lanka	**SE**	Sweden		
EE	Estonia	**LR**	Liberia	**SG**	Singapore		

SPECIFICATION

FOR

SYSTEM AND METHOD FOR FACILITATING COMMUNICATIONS OVER A DISTRIBUTED ELECTRONIC NETWORK

BACKGROUND OF THE INVENTION

1) Field of the Invention

The field of the present invention relates generally to services provided via a distributed electronic network and, in particular, to methods and systems for facilitating communication over a distributed electronic network such as the Internet.

2) Background

The worldwide computer information network, now commonly referred to as the Internet, is increasingly being used to provide access to sources of information and data on a world-wide basis. One of the bases for the universal success of the Internet as a tool for electronic commerce and information exchange has been the standardization of the Internet Protocol ("IP"). Many new uses are being found for the Internet and the world wide web. For example, the Internet is presently being used for communication applications. Internet telephony is becoming increasingly available, as is Internet video communication. However, in most or all conventional Internet telephony systems and Internet-based video communication arrangements, operation is dynamic only. In a dynamic system, each of the parties to the communication must connect to the Internet and remain connected. When a user disconnects or logs off, the user essentially "disappears" and becomes unreachable for the purposes of carrying out dynamic communications.

In addition, the Internet has led to increased usage of so-called electronic commerce or "e-commerce", which, in the vast majority of instances, involves on-

line ordering from electronic catalogs or lists. To date, little or no provision has been made to permit the use of salesmanship and up-selling of customers via the Internet.

A need therefore exists for facilitating communication over the Internet. A need further exists for allowing communication with Internet users who are not connected or logged on to the Internet when communication is attempted. A need also exists for an improved means of conducting e-commerce and, more particularly, improving selling opportunities and techniques over the Internet or other distributed electronic networks.

SUMMARY OF THE INVENTION

In one aspect, an Internet communications portal is described which provides a converged audio, video portal. In accordance with one aspect of the invention, a dynamic directory is provided in which the status of a user on the Internet is determined. A permanent directory of registered users is also provided in the system of the invention. The dynamic and permanent directories are merged and a single directory identifies registered users and active registered users. In the event that communications are to be established between one user and a registered user and that registered user is not indicated as being currently active on the Internet, the system will route the user to video or voice mail for the registered user.

In another aspect, a system and method for facilitating communication over a global electronic network (e.g., the Internet) comprises a web site having a dynamic directory which stores the on-line status of registered users of the Internet, along with permanent communication numbers and current IP addresses for each registered user. A user seeking to establish communication with another registered user enters the target user's permanent communication number. If the target user is on-line, the requesting user receives the target user's current IP address from the directory, and instant or live communication then ensues. In the event that the target user is not on-line, the system will route the requesting user's message to video or voice mail for the target user. When the target user

eventually comes on-line, the target user can retrieve messages from his or her mailbox. In one aspect, a system and method are provided for allowing either live or delayed communication to occur between users based upon whether the target user is on-line or off-line.

BRIEF DESCRIPTION OF THE DRAWING

The invention will be better understood from a reading of the detailed description of preferred embodiments in conjunction with the drawings, in which like reference designations are used for like elements, and wherein:

FIG. 1 illustrates a system cluster in accordance with the principles of one embodiment;

FIG. 2 illustrates a first embodiment of a virtual local area network configuration as may be used in connection with the system of FIG. 1;

FIG. 3 illustrates a second embodiment of a virtual local area network configuration as may be used in connection with the system of FIG. 1;

FIG. 4 illustrates a management architecture of the system of FIG. 1;

FIG. 5 illustrates a third embodiment of virtual local area network configuration as may be used in connection with the system of FIG. 1;

FIG. 6 illustrates a fourth embodiment of a virtual local area network configuration as may be used in connection with the system of FIG. 1;

FIG. 7 is a block diagram of the directory architecture in a system cluster;

FIG. 8 is a flow diagram illustrating an example of the operation of the directories of FIG. 7;

FIG. 9 is a representation of a visual display of merged dynamic and static directories;

FIG. 10 illustrates a system architecture in accordance an embodiment as disclosed herein;

FIG. 11 illustrates directory information flow between system clusters in the system architecture of FIG. 10;

FIG. 12 is a flow diagram illustrating an example of a process for registering a user with a personal identification code;

FIG. 13 is a flow diagram illustrating an example of a process for assigning a user a personal identification code;

FIG. 14 is an Internet device;

FIG. 15 is a block diagram of the Internet device of FIG. 14;

FIG. 16 is a flow diagram of an example of operation of the Internet device of FIG. 15;

FIG. 17 is a functional block diagram illustrating voice/video mail features as may be used in connection with the system of FIG. 1; and

FIG. 18 illustrates operation of a system for selling via the Internet.

FIG. 19 is a top-level diagram of an Internet-based communications system having a directory of permanent communication numbers.

FIG. 20 is an architectural diagram of one embodiment of the Internet-based communications system illustrated in FIG. 19.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

FIG. 19 is a top-level diagram of an Internet-based communications system 21, illustrating various concepts as disclosed herein. As illustrated in FIG. 19, at the core of the communications system 21 is a global electronic network such as, for example, the Internet 25. A variety of Internet devices 22 connect to the Internet 25, for the purposes of carrying out communication over the Internet 25. As used herein, Internet device 22 is any device which is directly accessible by or has the capability to directly access the Internet. An Internet device 22 may be, for example, a computer or a personal communication device (such as an IP telephone or videophone), and may access the Internet by wireless or non-wireless type of connection. The particular method and manner in which an Internet device 22 accesses the Internet 25 is not important to the operation of the invention as broadly described herein.

As further shown in FIG. 19, a web site 26 connects to the Internet 25. The web site 26 comprises a web server 27 and a directory of permanent communication numbers stored, for example, in a database 28. An example of at least a portion of the contents of a suitable directory is illustrated in FIG. 9, and

includes such things as a user name, an indicator of the user's online status, and a unique permanent communication number assigned to the user. The database 28 may comprise a dynamic portion subject to relatively frequent updating, and a permanent portion subject to relatively infrequent updating. A user may be assigned a permanent communication number by, e.g., registering with the web site 26. Further details about the use of permanent communication numbers are set forth later herein.

When a first user desires to communicate with another user, the first user connects to the web site 26 and enters the target user's permanent communication number, which gets transmitted to the web site 26. If the target user is on-line, the requesting user receives the target user's current IP address from the database 28 based upon the target user's permanent communication number, and instant or live communication then ensues between the requesting user and the target user. In the event that the target user is not on-line, the web site 26 allows the requesting user to store a message in the video or voice mail for the target user. When the target user eventually comes on-line, the target user can retrieve messages from his or her mailbox.

FIG. 20 is an architectural diagram of one embodiment of the Internet-based communications system illustrated in FIG. 19. Similar to FIG. 19, and as illustrated in FIG. 20, at the core of the communications system 31 is a global electronic network such as, for example, the Internet 35. A variety of Internet devices 32 (which may be any of the types of devices as discussed with respect to Internet devices 22 in FIG. 19) are shown connected to the Internet 35, for the purposes of carrying out communication over the Internet 25. As further shown in FIG. 20, a web site 36 connected to the Internet 35 comprises a web server 37 and a directory of permanent communication numbers stored, for example, in a static database 40. A dynamic database 41 stores the on-line status of users associated with the permanent communication numbers stored in the static database 40. Users seeking to communicate with other users may access the web site 36 and enter the permanent communication number of the target user, and obtain the target user's most recent IP address and current on-line status

thereby. If the target user is not on-line, then the requesting user may leave a message in a mailbox for the target user. The message may be retrieved when the target user comes on line.

FIG. 1 illustrates a system cluster configuration as may be utilized in connection with one or more embodiments as described herein. As shown in FIG 1, the global computer network known as Internet 51 is represented as a cloud. A co-location service 100 is also shown as a cloud in accordance with the convention of showing various network structures and functions as a cloud representation, where the specific details of the implementation of the particular structure or functionality are not particularly significant. Co-location service 100 in the system of the illustrative embodiment is provided by GlobalCenter, but may be any similar entity that is in the business of co-locating web services. Information regarding GlobalCenter is available on the Internet at the Internet address www.globalcenter.com. Co-location service 100 provides a large facility direct connection for continuous monitoring of the server site.

Co-location service 100 is linked to a router 101 via a link 113. Router 101 may comprise any suitable router unit. Router 100 provides connections to the Internet 51. Router 101 provides a single point of entry from the system of the invention into the Internet 51. From a user's perspective, router 101 provides a single point of contact for users. When a user types in a specific Uniform Resource Locator (URL), e.g., "http://www.visitalk.com" (a domain name associated with the name of the present applicant), the user is directed to router 101. Therefore, the address or name "visitalk.com" (in this example) will resolve to the IP address of router 101. In the illustrated embodiment, router 101 is coupled to two director switches 103, 107 via links 115, 117, respectively.

Each director switch 103, 107 is a commercially available unit. In the embodiment of the invention described herein, director switches 103, 107 comprise the ACE director available from Alteon and described in detail in data sheets provided on-line at Alteon's web site located at http://www.alteon.com/products. The Alteon ACE directors are characterized as having an 8 gigabyte backplane. The ACEdirector is a Layer 4+ switch which

includes software capability for high performance server load-balancing. In the illustrated embodiment, director switches 103, 107 are configured in a redundant configuration such that one director 103 is redundant to the other director 107 and only one director switch 103 or 107 is active at any time. If one director switch, e.g., director switch 103, fails, the other director switch, e.g., director switch 107, picks up immediately. The failed director switch 103 may be replaced without taking the entire system down. A link 119 is provided between director switches 103, 107. Link 119 is preferably a high-capacity link which, in the illustrative embodiment, is a one gigabyte link. This link is a high capacity link so that, in the event failures occur in either link 115 or link 117, or if failures occur in the links between one director switch 103 or 109 and one of the enterprise switches 105, 109, then all traffic may be routed over link 119. Each director switch 103; 107 is a switching network that balances traffic across multiple servers or other devices. Director switches comprise software and/or hardware configured so that each sends three streams of traffic into each of the enterprise switches 105, 109.

One director switch, e.g., director switch 107, is designated and utilized as a primary director switch. The other director switch, i.e., director switch 103, is utilized as a secondary director switch. The secondary director switch 103 remains quiescent or dormant until a fault or failure associated with the primary director 107 occurs. The redundancy factor provided by the directors 103, 107 includes coverage of more than failure of one of the director switches 103, 107. The failure could also include a failure of either one of the links 115, 117 coupling the director switches 104, 107 to router 10 1.

Each director switch 103, 107 routes traffic to enterprise switches 105, 109 and to the server cluster 111 beyond director switches 105, 109. Link redundancy capability is provided between each director switch 103, 107 and the enterprise switches 105, 109. In the illustrated embodiment, three links are provided between each director switch and each enterprise switch. Links 121, 123, 127 connect director switch 103 to enterprise switch 105. Links 122, 124, 126 connect director switch 103 to enterprise switch 109. Links 131, 133, 137 connect director

switch 107 and enterprise switch 105. Links 132, 134, 136 connect director switch 107 and enterprise switch 109.

The number of links between each director switch 103, 107 and each enterprise switch 105, 109 corresponds to the number of networks included in each enterprise switch 105, 109. With this arrangement, each director 103, 107 is coupled to three network portions of each enterprise switch 105, 109.

Utilizing three different traffic paths between each director 103, 107 and each enterprise switch 105, 109 increases the ability to push more traffic through the system and to segregate that traffic into additional networks at the server level. There are three routes of traffic into each enterprise switch 105, 109 from each director switch 103, 107.

Enterprise switches 105, 109 are, in the illustrated embodiment, very large capacity switches. Each enterprise switch 105, 109 is very redundant, i.e., each includes three networks and each can accommodate a very large numbers of users. Each enterprise switch 105, 109 has a large switching fabric through which a high volume of data may be switched. The enterprise switches in the illustrative embodiment are characterized by 24 gigabit backplanes. A particularly well suited enterprise switch which may be used in the system of the illustrated embodiment is the Catalyst 4000 Series available from Cisco and described in various documentation available at Cisco's web site located at http://www.cisco.com.

Both enterprise switches 105, 107 are, in the illustrated embodiment, active all the time, but if a failure disables one of the enterprise switches 105, 109, only half the network will be lost. The loss affects capacity of the system, but it does not take down the network. If only one of the enterprise switches was active at a time, and the other enterprise switch ran in a hot standby mode, the performance of the system would be determined by only one enterprise network. By running both enterprise switches active, the overall system performance is doubled. Each enterprise switch 105, 109 independently communicates with the server cluster 111. If either one of enterprise switches 105, 109 goes down, the entire traffic load can be handled by the remaining enterprise switch. The functionality of the

cluster may be maintained if one director switch 103, 107 is lost, but not necessarily the load.

In the system architecture, a number of virtual local area networks or V-LAN's have been set up behind enterprise switches 105, 109. By providing for V-LANs, various servers can communicate with each other through the enterprise switches 105, 109. This arrangement serves to divide up the traffic. One VLAN cannot see another. Traffic is segregated, band width is improved, and contention among resources on the network is reduced. In the various drawing figures that follow, each VLAN shows the most relevant portion of the network to provide an understanding of its structure and functionality. For purposes of clarity, not all elements of FIG. 1 are repeated in each of the VLAN drawing figures.

In the system of the invention, two servers LDAP 1, LDAP2 of service cluster 111 are provided for "lightweight directory access -protocol" (LDAP). LDAP is used with a service that allows a user with a certain type of software to log on and connect to the server and see a directory of other people who are logged into that server. VLAN2 shown in FIG. 2 is the VLAN that is used by Internet traffic users. In the illustrated embodiment, each server LDAPI, LDAP2 has two Internet protocol (IP) addresses: Server LDAP1 has IP addresses 10.2.1.1 and 10.6.1.1, and server LDAP2 has IP addresses 10.2.1.2 and 10.6.1.2. Referring back to FIG. 1, traffic from router 101 and director switches 103, 105 is routed to enterprise switches 105, 109. Director switches 103, 107 distribute that traffic to VLAN 2. Director switches 103, 107 determine what type of traffic it is and determine which server the traffic goes to Director switches 103, 107 forward the data packets to VLAN 2 and, ultimately, to the appropriate server. Director switches 103, 107 determine that the traffic is LDAP traffic and determine which of the four LDAP IP addresses the traffic is going to. Although each server LDAP1, LDAP2 has two IP addresses, only one instance of LDAP is running on each server LDAP1, LDAP2, but each server LDAP1, LDAP2 may be served from either of its two IP addresses. In operation, all four LDAP IP addresses will be looked at and a determination made as to which IP address has the least traffic. Each IP address is associated with a separate network interface card at the server

LDAP1, LDAP2. Accordingly, each server LDAP1, LDAP2 includes two network interface cards for redundancy. If one network interface card fails, the traffic is routed to the other network interface card of that server. The network interface cards used in the servers of the illustrated embodiment are commercially available units. Each network interface card includes dual ports and therefore supports two link connections and can therefore have two IP addresses, one for each of the dual ports.

After the director switches 103, 107 determine which server LDAP1, LDAP2 has the least traffic, traffic is forwarded to the appropriate server IP address. The selected server LDAP I or LDAP2 processes the user traffic and provides a response back through the VLAN. To the server LDAP1, LDAP2 the operation is like a typical server request in which the server is plugged into a network and is working. Server LDAPI, LDAP2 just sends a response back to the appropriate address, which is carried in the packet. As should now be apparent, the system of the invention provides balancing at the network interface card level as contrasted with balancing at the server level.

Servers LDAP1, LDAP2 only support LDAP. Running LDAP service provides directory service to users connecting to it. Suitable LDAP software is available from a number of vendors. In the illustrative embodiment described herein, the LDAP software is Microsoft's version which comes in a product called Microsoft Site Server. LDAP is an industry standard, but several different companies create versions of it.

Turning now to FIG. 3, the system of the invention includes a VLAN having three Internet Information Servers (IIS) IISMTS1, IISMTS2, IISMTS3. The VLAN, including servers IISMTS1, IISMTS2, IISMTS3, operate in exactly the same manner as VLAN 2 servers LDAP1, LDAP2. Each server IIMTSI, IISMTS2, IISMTS3 utilizes IIS software which is commercially available from Microsoft. MTS, Microsoft Transaction Server, is a software depository for business objects. Software objects that users create that do certain tasks all reside on MTS. Each one of servers IISMTS1, IISMTS2, IISMTS3 supports two functions. Each provides service via IIS and provides back-room software functionality with MTS.

On each of servers IISMTS1, IISMTS2, IISMTS3, MTS objects perform certain functionality on the network. The servers IISMTS1, IISMTS2, IISMTS3 are physically separate servers from the LDAP servers, LDAP1, LDAP2, but each works in the same way. Server IISMTS1 has two IP addresses, 10.2.1.3 and 10.6.1.3 and is linked to enterprise switch 105 via link 301, and to enterprise switch 109 via link 303. Server IISMTS2 has IP addresses 10.2.1.4 and 10.6.1.4, and is linked to enterprise switch 105 via link 305 and to enterprise switch 109 via link 307. Server IISMTS3 has IP addresses 10.2.1.5 and 10.6.1.5 and is linked to enterprise switch 105 via link 309 and to enterprise switch 109 via link 311. Turning again back to FIG. 1, director switches 103, 107 sense when a user is utilizing a browser such as Netscape or Internet Explorer and the user requests a page by putting sending a URL. Director switches 103, 107 determine that the URL request is to be routed through IIS for page service.

On a page, there may be icons or the like which may be clicked on to cause an MTS object to activate. When the user clicks on such an icon, a program is executed on a server, e.g., server IISMTS1. Server IISMTS1 executes one or more objects that causes something else to occur. For example, another object may be displayed, an entry may be added to a data base, or an order may be processed. Two network interface cards, each corresponding to one IP address in each server IISMTS1, IISMTS2, IISMTS3, provide redundancy so if any one interface card fails the server switches activity to the second network interface card in the same server. If a server IISMTS1, IISMTS2, IISMTS3 fails it fails over to the other two servers. Thus, the system provides triple redundancy at the server level and single redundancy within a server for IIS and MTS. In this VLAN there is redundancy to each server IISMTS1, IISMTS2, IISMTS3.

In FIG. 4, the VLAN management network of the system of the invention is shown as VLAN3. VLAN3 includes, inter alia, a management server MGT. This VLAN management network provides server management as well as switching infrastructure management. Remote management capability is provided by connection through a Point-to-Point Tunneling Protocol ("PPTP") link 400 from the Internet 51. VLAN management network VLAN3 is also used for Sequel Server

connectivity as well as LDAP replication. Redundancy is again provided with each of the network servers MGT, IISMTSI, IISMTS2, IISMTS3, LDAP1, LDAP2, SQL1 and SQL2 having connections to both enterprise switches 105, 109 via network interface cards located at the respective servers. The network interface cards are not shown in the drawing Figures to reduce drawing clutter, but those skilled in the art understand that each link connection to a server as shown in the various figures has a network interface card connection at the server. Management server MGT has link 401 to enterprise switch 105 and link 403 to enterprise switch 109. IISMTS servers IISMTS1, IISMTS2, IISMTS3 have links 405, 409, 413 to enterprise switch 105 and links 407, 411, 415 to enterprise switch 109. LDAP servers LDAP1, LDAP2, LDAP3 have links 417, 421 to enterprise switch 105 and links 419, 423 to enterprise switch 109. Sequel servers SQLI, SQL2 have links 425, 429 to enterprise switch 105 and links 427, 431 to enterprise switch 109. In this VLAN, only one EP address is assigned per server. The servers will fail over from one link to the other in the event of a network interface card failure. Upon occurrence of a network interface card failure, the IP address is automatically transferred to the active network interface card connection.

In VLAN3 the two LDAP servers LDAP1, LDAP2 are the same as shown in VLAN2 of FIG. 2 but their connections are different. At the server level, hardware is managed from the server MGT. There are actually six connections out of each server provided by three dual port network interface cards on the servers IISMTSI, IISMTS2, IISMTS3, LDAP1, LDAP2. The management server MGT and each sequel server SQL1, SQL2 each have two physical network interface cards, both dual port. Whenever an IISMTS server needs to talk directly to a sequel server, it will go through network VLAN3. The sequel servers SQL1. SQL2 are the database depository for any data collected. Searches are conducted against the sequel server databases. An Internet user will connect to one of the IIS servers IISMTS1, IISMTS2, IISMTS3, but because director switches 103, 107 perform load balancing, the user can not predict which one he enters the system through via the URL address.

For example, when a user enters the system with a request, one of the director switches 103, 107 passes off the request to one of the IIS servers IISMTS1, IISMTS2, IISMTS3. When the user clicks on a button that says "Member Search". The IISMTS server to which the user is connected passes a request within VLAN 3. The request is routed to a sequel server SQL1 or SQL2 as the user request is for is a database operation.

A remote management facility can connect to management server MGT via the Internet 51 and link 400, and perform any management needed with the servers, such as reconfiguring software and monitoring resources to identify loading. A primary purpose of this network VLAN3 is to support communication between servers and to facilitate control of the servers via a remote management station. Management server MGT can access any of the servers IISMTS1, IISMTS2, IISMTS3, LDAP1, LDAP2, SQL1, SQL2 and it can access enterprise switches 105, 109 and perform configuration tasks.

VLAN3 functions as an internal "housekeeping" network that maintains all database data and LDAP traffic. The remote management station accesses the management server MGT via a point-to-point tunneling protocol, which is a way of accessing server MGT using encryption.

A further VLAN is provided in the system of the invention as shown in FIG. 5. VLAN network VLAN4 includes LDAP servers LDAP1, LDAP2. Enterprise switches 105, 109 each have access to both LDAP servers LDAP1, LDAP2. LDAP server LDAP1 has, in the illustrated embodiment, IP addresses 10.4.1.1 and 10.7.1.1 and is linked to enterprise switch 105 via link 501 and to enterprise switch 109 via link 505. LDAP server LDAP2 has IP addresses 10.4.1.2 and 10.7.1.2 and is linked to enterprise switch 105 via link 505 and to enterprise switch 109 via link 507. LDAP server LDAP1 has two IP addresses. In the illustrative embodiment, VLAN4 serves provides a pool of the LDAP servers for internal system access only to the transaction servers IISMTS1, IISMTS2, IISMTS3. VLAN2 is for Internet users whereas VLAN4 is for transaction servers in the server cluster 111.

For example, when a user connects to server cluster 111 from the Internet 51 to access the permanent directory from one of sequel servers SQLI, SQL2, the accessed sequel server SQLI will file an MTS object that will go out and perform a look-up on an LDAP directory. The system includes two different kinds of directory: An LDAP directory which may be supported almost entirely out of the box by any appropriate LDAP application, e.g., Microsoft LDAP, and a permanent directory which is a directory of all members to the service provided by the system. The members identified in the permanent directory may or may not be currently on-line on the Internet. This permanent directory database is maintained by the sequel servers SQLI, SQL2. A second directory provides a list of all the permanent directory members who are on-line at substantially the time a request is made. One of the servers IISMTS1, IISMTS2, IISMTS3 executes an MTS object to do a look up against active members and will indicate whether or not a member is on line. As will be explained elsewhere, if a member is on line, a call can be made to the active member and real-time communication can occur. VLAN4 supports that kind of traffic so that IISMTS servers IISMTSI, IISMTS2, IISMTS3 can fire MTS objects that perform certain operations against the LDAP directory. This traffic is segregated from all other traffic.

Turning now to FIG. 6, VLAN 5 is the network used for traffic destined for LDAP servers LDAP1, LDAP2, LDAP3. VLAN5 has one primary side and a standby side. The destination is to a virtual IP address that is provided by a director switch 103 or 107 . Once the virtual IP address is utilized, traffic will be load-balanced to the two LDAP servers LDAP1, LDAP2. Each IISMTS server IISMTS1, IISMTS2, IISMTS3 has one IP address. In an illustrated embodiment, server IISMTS1 has address 10.5.1.3 and is linked to enterprise switch 105 via link 601 and is linked to enterprise switch 109 via link 603. Server IISMTS2 has address 10.5.1.4 and is linked to enterprise switch 105 via link 605 and is linked to enterprise switch 109 via link 607. Server IISMTS3 has address 10.5.1.5 and is linked to enterprise switch 105 via link 609 and is linked to enterprise switch 109 via link 611.

For example, if a user wants to obtain a directory listing, the request will come in on VLAN5. The request goes to the primary director switch 103 which in turn looks at the loading on VLAN4. LDAP servers LDAP1, LDAP2 and transmits the request to the more lightly loaded server. The LDAP result is sent back to the director switch 103 which presents the results back to the requesting object.

In another example, if a member search is performed for all members having a specific listed interest, a request will cause an MTS object on VLAN 5 to fire. The system would then route the request back up to director switch 103 to VLAN 3. In accordance with the system of the invention one server talks to another server across virtual networks where the resource that it needs, such as the LDAP directory, is not on the same virtual network.

A significant advantage of the system of the present invention as illustrated is that it is an Ethernet type of network in which contention is reduced significantly. Contention is reduced by creating artificial separate networks so that, for example, whenever a sequel server SQL1 is talking to an LDAP server LDAP1, that communication place over a particular VLAN. None of the other VLANs hears the communication. When MTS server IISMTS1 is talking to LDAP server LDAP1, that happens over a particular VLAN and therefore does not interfere with other traffic. Thus contention is greatly reduced. Thus, a very complex Ethernet type network is formed into multiple simpler Ethernet type networks, each of which is still contention-based but which has a reduced volume of traffic.

The system of the present invention provides a high level of security. Traffic cannot pass from one VLAN to the next without authority of either a director switch 103, 107 or an enterprise switch 105, 109. The VLAN networks are effectively hidden from the Internet. In other systems, if a "hacker" hits a switch he will either get through the switch or not. In the present system, even if the hacker were to get through the switch, he could still not get into any VLAN. Depending on what kind of traffic the hacker is sending, not only would he have to spoof fool his way through the switch, but the hacker would have to know how to get from the switch into the particular VLAN that he wanted access to. However, the VLANs are hidden from the entire Internet via director switches.

In the system as illustrated there are multiple networks and 5 VLANs. Each VLAN, though called a virtual local area network, is separate from each other. Servers and switches are preferably on the same VLANs and on the same network, then they can talk to each other. For example, FIG. 3 shows IISMTS servers IISMTSI, IISMTS2, I.ISMTS3 all on the same VLAN2. Exemplary IP addresses for each server port are indicated. The address includes a network number portion and a host address portion. For IP address 10.2.1.3, the network number portion is 10.2.1 and 3 is the actual host address portion. The only other switches and servers that can communicate with IP address 10.2.1.3 are ones that have an IP address beginning with 10.2.1, i.e., IP address 10.2.1 defines a network. IISMTS server IISMTS1 has a second link connection to enterprise switch 109 which carries IP address 10.6.1.3. That IP address is on a completely different network which may be identified as network 10.6.1. So the only communications that can occur with IP address 10.6.1.3 are with other servers or switches with addresses 10.6.1, which in VLAN 2 shown in FIG. 3 are servers IISMTS2, IISMTS3 with IP addresses 10.6.1.4 and 10.6.1.5. The VLANs in the system of the invention actually separate traffic. The only way to make two networks talk to each other is by a router. Each director switch 103, 107 is, among other things, a router. So each director switch 103, 107 can communicate with the different networks. So a director switch 103, 107 can communicate with either the 10.2 or the 10.6 side of the servers IISMTS1, IISMTS2, IISMTS3 of VLAN2. By combining two different networks into a single VLAN, redundancy is provided and performance is enhanced. If an entire network goes down, functionality is not lost.

The system of the present invention provides both a dynamic and static directory. In the illustrative embodiment, the dynamic directory provides a list of Internet users who are currently connected to a server, and the static or permanent directory provides a list of members to services supplied by the server or related servers and system.

Figs. 7 and 8 are useful for understanding the dynamic directory. When an Internet user initially turns on his or her computer, loads the appropriate

communications software, e.g., a client program conforming to the H.323 specification, and enters the name or address of a site that he or she desires to access, the client software automatically connects to the server associated with that site. When the user connects to the server, the server obtains user information via the client software. The user information is stored in an LDAP dynamic directory and for as long as the user is connected to the LDAP server, the user information is maintained. The information is not stored to a permanent directory and when the user drops his or her connection to the server, the user information is dropped. In addition, a permanent directory is provided which may be on a different server, or may be part of the same logical database. The permanent directory includes all users which have chosen to register with the service provided. In accordance with the principles of the invention an interaction is provided between the dynamic and permanent directories. Users stored in the permanent directory are offered an opportunity to register at the site in return for various service and/or product offerings that are made available. Users register with their name, address, and all other relevant information. The users become part of the permanent list whether they are connected to the server or not, and they are always on that list. Because it is desirable to develop an increasingly large permanent directory, the system of the present invention is unique in that it actively solicits membership. As shown in the flow diagram of, FIG. 8, as a user logs on to the server at 801, the user's email address is extracted from the user's clients software at step 803 and their email address is added to the dynamic directory as indicated at step 805. The permanent directory is accessed and the user's address is looked up at step 806. If the user is not already listed in the permanent directory, the user is listed in the permanent directory and flagged to indicate that the user has been sent an invitation to register at step 807. An instant email is sent to the user based upon the email address provide to the server from the user's client software at step 808. The email will provide an invitation to join the permanent directory. If the user has previously registered, an email message may be automatically sent to him to provide specific information as indicated at step 813. When the user signs off at the site, the information stored

in the dynamic directory is relinquished. One significant feature of the arrangement described above is that the identifying information is not consciously provided for collection at the time it is collected. When setting up the client software, i.e., the H.232 software, the user enters an email address and other information so that any server to which the user connects to subsequently is provided that information. In many instances, the information provided is intentionally deceptive or inaccurate because the user does not want to have his or her real identity known. To eliminate deceptive, incorrect identities, the present system monitors email returns at step 819. If the email sent to the user is returned within a short period of time, the presumption is that the email address is incorrect and the user will be dumped from the dynamic directory as indicated at step 821. This is done to for example eliminate pornographic, foul or obscene bogus email addresses which are frequently used where directory listings of users are accessible on the Internet. If no email is returned within the period time for an auto return, the registration process may be initiated at step 823.

In one embodiment, users may become listed in the permanent directory in one of two ways. Either they visit the web site and register on their own, or else a trigger was fired which caused an entry to be made in the permanent directory without the user knowing that the entry was being made. Thus the user shows up in the permanent directory whether or not the user is currently on-line.

In accordance with one aspect of the present invention, the permanent and dynamic directories are merged as shown in FIG. 9. When a user is viewing the permanent directory one tabular column of the display will include an indication that indicates which registrants are presently on-line. In the display of FIG. 9, a flashing spot giving the appearance of a flashing green light indicates that a registrant is on-line. In operation, when a user logs into the permanent directory, as the web site is downloading the permanent directory list to the user, it cross references with the dynamic memory to see if any of the permanent directory entrants are on-line. So as each registrant is listed the dynamic directory is checked to see if the registrant is on-line and a visual indication is provided on the displayed list. The result of the utilization of the dynamic directory, the permanent

directory and the merge is that users know if other registrants are on-line. This provides the capability of establishing real time communications via audio and/or audio-video communication. In addition, the merged list as displayed include a connect button or icon which permits establishing communication in real time. In the event that a desired registrant is not currently online, other services may be utilized by the user.

In an alternate embodiment of the invention, visual representations of the dynamic directory are not utilized. Instead, in this embodiment, each computer includes a connector object program which is loaded into the computer. Such a connector object program may, for example, be downloaded into the computer from the visitalk.com website. The connector object preferably runs in the background as a non-visual program. The connector object maintains a connection to the non-visual directory. It does not return a list to the computer, but instead polls the system director 103, 107 (e.g., using a Ping command) to let the system director 103, 107 know that it is still on-line. In this embodiment of the invention, the permanent directory will know whether a user is on-line because the connector object maintains a connection to the system. At the user's computer an icon is displayed on the computer screen at the system tray. With a connector object as used in the system of the invention the connector object permits the user to connect to the LDAP directory without having to receive a visual representation of a directory locally. Typically when a LDAP file is accessed, the LDAP file will return a directory. In the present instance, the return of the directory from the LDAP server is suppressed.

FIG. 10 illustrates a system architecture in accordance one embodiment as disclosed herein. As illustrated in FIG. 10, a plurality of system clusters 111 are connected to the Internet 51. Each system cluster 111, which may be located in a different geographic area, serves as a communications portal to the Internet 51. Each system cluster 111 is substantially the same from a functionality standpoint, but the various system clusters 111 may have different numbers of servers connected. Each system cluster of the invention is readily scaleable up in number of servers connected to the enterprise switches 105, 109. One reason for

providing geographically separate clusters is so that long distance telephone access charges for users to access the system clusters 111 may be minimized. Each system cluster 111 provides communication services for its geographic area via the Internet and between other geographic areas also via the Internet 51. Each system cluster 111 may be accessed by users having a variety of Internet devices 71 which include, by way of example (not limitation), computer terminals and personal communication devices such as pagers, phones, video devices and the like. Also connected into the system is one or more management centers 81. Management centers 81 provide the system cluster management functions described above in conjunction with the management server MGT. By providing a system architecture such as shown in FIG. 10, substantially worldwide real time communications access may be provided to users of the system.

As described above dynamic and permanent directory functions are provided in the system clusters 111. The permanent directory provides information for users who have registered to use services provided by the system. The dynamic directory provides information on users who are logged on to the web site serviced by a cluster in one embodiment and have their Internet device activated or turned on in another embodiment. In one embodiment of the invention, each system cluster 111 maintains its own directories. To assure that each system cluster directory contains up to date information regarding who is currently logged on to the system, communications paths are established between the system clusters 111 to exchange directory update information between the system clusters. Each system cluster 111 will thus maintain a substantially complete and updated directories. In accordance with one aspect of the invention, each system cluster will periodically broadcast directory changes that have occurred during the immediately prior predetermined time period to all other system clusters 111. By maintaining updated directories at each system cluster, the reliability of the system is enhanced. FIG. 11 illustrates the Internet 51 connections 51 between several of the system clusters for broadcasting directory updates to other system clusters 111.

Although the description above has focused on the illustrative embodiment in which computers are used to access the servers, the computers can just as easily be an Internet device. As used herein, an Internet device is any device which can access or be accessed by the Internet and includes all manner of devices such as computers, communication devices such as telephones, videophones, cameras, keyboards and any other input/output device which is connectable to the Internet either directly or indirectly. For example, a personal communications device may be used as an Internet device.

To facilitate the use of the system as a fully integrated and operational communications portal, each user of the system in one embodiment of the invention has a personal identification code or permanent communication number. The permanent communication number is a permanent personal identification code that is pre-assigned to the registered user of the communication services provided by the system of the invention. Whenever a registered user enters his or her personal identification code into an Internet device, that Internet device becomes identified in the system directories as the Internet device at which the registered user is active. With this type of an arrangement, a registered user can receive communications at any Internet device so long as the user has entered his or her permanent communication number on the Internet device. To avoid multiple Internet devices from being indicated as the Internet device at which the registered user is located, the system of the invention will update the directory listing for each user to overwrite any entries for prior Internet devices at which the user has registered his or her permanent communication number. The interactive operation of the registration of a user using a permanent communication number with the system of FIG. 10 is shown in the flow diagram of FIG. 12. Initially, a user registers with system at step 1201, providing identification information including name, a billing address and credit card information. The system assigns a permanent communication number to the user which is unique to the user at step 1203. A permanent directory entry is made for the registered user at step 1204. The user may, as indicated at step 1205 enter the personal identification code at any Internet device such as device 1007 shown in FIG. 10. In one embodiment of

the invention, upon entry of the permanent communication number at Internet device 1007, Internet device 1007, at step 1207 utilizing a connector object as described above accesses one of the system clusters 111. The system cluster 111 verifies that the permanent communication number is a valid code at step 1209. If the permanent communication number received at the system cluster 111 is not a valid permanent communication number, service to the Internet device 1007 is denied as indicated at step 1211. If the personal identification code is a valid permanent communication number, the permanent directory is updated to indicate that the user is accessible on the system at step 1213. The service cluster 111 in one embodiment of the invention will return information to the Internet device 1007 to indicate at step 1215 whether the Internet device 1007 is accessible via the system or whether service is denied. If the Internet device 1007 is accessible via the system, Internet device may receive incoming calls via the system. Subsequently, if the user activates a second Internet device 1009 using the same permanent communication number the process is repeated and the directory is updated with the IP address of the Internet device 1009. The prior directory entry is overwritten and all incoming calls to the user will now be routed to the Internet device 1009. In any instance when the directory at the system cluster 111 at which the user activates an Internet device 1007 or 1009, the directories at all the system clusters 111 will be updated to reflect the status of the user as being accessible on the system as described above.

The system of the invention may also be used to establish communications between Internet devices and non Internet devices. For example, if a user at Internet device 1009 desires to establish a communication with a conventional telephone type device, the registered user at Internet device 1009 can also access a telephone directory listing and launch a call to the conventional telephone device via the system of the invention. More specifically, as shown in FIG. 14, a user having registered his or her presence at Internet device 1009 as indicated in FIG. 12 by entering a permanent communication number enters the telephone number of the desired telephone at step 1401. System cluster 111 which Internet device 1009 accesses receives the telephone number and through

a directory lookup at step 1403 identifies the system cluster 111 in geographic proximity to the telephone switching center 1421 to which the telephone number is associated to minimize telephone costs associated with placing such a call. An Internet connection between the system cluster 111 to which Internet device 1009 is associated and the system cluster 111 which is in proximity to switching center 1421 at step 1405.

The permanent communication number is an identifier which is preferably uniquely assigned to an individual. The assignment of each permanent communication number is by a controlling entity which has responsibility for assigning the permanent communication number upon request. The assignee of the present invention, for example, generates and assigns permanent communication number. Each permanent communication number is preferably a 12 digit numeric code arranged in a format of "xyyy yyyy yyyy" where "x" is any number from 2 to 9 and "y" is any number from 0 to 9, although of course the permanent communication number may be chosen to be any size, depending mainly upon the number of users there are expected to be. In assigning each permanent communication number, the assignment is generally made in a sequential fashion. As each permanent communication number is assigned, a permanent directory entry is made for that permanent communication number. When an Internet device user enters his or her permanent communication number at the Internet device, the Internet device is uniquely associated with that individual until such time as he or she enters the unique permanent communication number at another Internet device. Each Internet device includes a unique device identifying code such that when an Internet device logs onto a system, the Internet device is specifically identified. The permanent communication number directory is updated to indicate the number of the Internet devices at which the user has entered his or her permanent communication number. Thus when a user enters his or her permanent communication number, the specific Internet device identity and the permanent communication number are forwarded to the system directory. The assignment of Internet device numbers is similar to or the same as the present assignment to each computer and each

cellular phone presently manufactured of a unique equipment identification number. Thus, an individual can receive communications directed directly to him or her at any Internet device located anywhere in the world thereby providing unparalleled communications capability and access.

A process for assigning permanent communication numbers is illustrated in FIG. 13. At step 1301, a request is received from a user for a permanent communication number. At step 1303, a determination is made as to whether or not the request is for a vanity number or not. If the request is not for a vanity number, the next available permanent communication number number is identified at step 1304. The available number is assigned to the user at step 1305. The permanent directory is updated at step 1307 to reflect the assigned permanent communication number and the user information. The user is notified of his or her permanent communication number at step 1309. Returning back to step 1303, if it is determined that the user has requested a vanity permanent communication number, and the vanity permanent communication number is available, it is assigned at step 1305, and the remainder of the process repeats. If however, it is determined at step 1311 that the vanity permanent communication number is not available, the user is notified of the unavailability at step 1313.

As indicated above, the system in accordance with certain embodiments as described herein allows any Internet device to access system provided services. In accordance with yet another aspect of the invention, a novel Internet device is provided. In accordance with the principles of the invention, an Internet device is any device which is directly accessible by or has the capability to directly access the Internet and which receives a permanent communication number. The Internet device may be a computer, a personal communication device such as a telephone, videophone, and may access the Internet by wireless or hardline type of connection. The method and manner in which the Internet device accesses the Internet is not important to an understanding of the present invention.

An Internet device 1401 in accordance with one embodiment is shown in FIG. 14. Internet device 1401 is a personal communication device. The device 1401 includes one or more data input devices such as keypad 1403, or

microphone 1404, and touch screen 1405, or sensors 1406, or any other device or element for the inputting of personal identification information. In the illustrative embodiment of Internet device shown, the keypad is used to enter the permanent communication number of a user. A display included in the Internet device 1401 may prompt the user to enter his or her permanent communication number when the device 1401 is powered-up.

A block diagram of the Internet device 1401 is shown in FIG. 15. The Internet device 1401 includes a processor 1501 and associated memory 1503, a receiver 1505, a transmitter 1507 and antenna 1509. The operation of the device 1401 is substantially the same as commercially available digital cellular phones and commercially available digital personal communication devices. Reference may be made to any number of prior art documents that describe the general operation and architecture of prior digital cellular phones and digital personal communication devices. One significant difference between the Internet device 1401 and various prior art personal communication devices and cellular phones and the like is that the Internet device 1401 is preferably compatible with the International Telecommunications Union (ITU) recommendations for implementing H.323 protocol. The ITU H.323 recommendation is a mutually agreed upon specification which defines how personal computers can interoperate to share audio and video streams over computer networks including intranets and the public Internet. The operation of the Internet device 1401 of the present invention is shown in the flow diagram of FIG. 16. At power up 1601, the processor 1501 operates to display a prompt to the user of the Internet device 1401 to enter his or her permanent communication number as indicated at step 1603. The user then enters the permanent communication number at step 1605. The Internet device 1401 by use of a connector object transmits the received permanent communication number to the Internet server at step 1607. In addition, the Internet device 1401 transmits a unique equipment code identifying the particular Internet device 1401 to the server. When a server receives the permanent communication number and the equipment code, the server updates its directory to reflect the association between the permanent communication number and the

specific Internet device 1401. The server will return information to the Internet device 1401 at step 1609 indicating that the Internet device has been denied service as indicated at step 1611 or that it is active as indicated at step 1611. Internet Protocol communications may be received at Internet device 1401 from other users connected to the Internet. The Internet device 1401 as long as it is powered up will periodically provide its equipment code and the entered permanent communication number to the Internet server as indicated at step 1613 via a connector object to indicate that the user's Internet device is available for receiving incoming calls. In one embodiment of the invention, the Internet device includes memory 1507 for storing more than one permanent communication number, thereby permitting an Internet device 1401 to be simultaneously accessible for calls for more than one individual, or for more than one purpose such as for business and personal use, or so that all members of a group may register for use of a common Internet device.

Turning back to FIG. 10, an example of operation of one embodiment as described herein essentially provides an IP-based central switching center or central office for supporting Internet devices 71 or H.323 devices, i.e., not for supporting prior art telephone devices but for supporting software which in turn supports the H.323 protocol. In such an embodiment, site cluster 111 functions as an IP central office switch for IP communications. Each site cluster is part of the Internet as viewed by Internet devices and anyone on the Internet can access the system cluster. The system cluster provides a directory of users, a listing of the permanent communication numbers, voice mail, video mail, conferencing service, all the services that one would expect from traditional public switched digital telephone switching center. Where prior art digital telephone switching systems provide dial tone, access, listings and directory services for traditional telephones coupled through analog circuits, the system cluster 111 provides the same functionality for Internet devices connected utilizing IP to the system cluster directory. The services are provided by the servers shown in the various figures.

In one aspect, certain embodiments as described herein operate as an equivalent PBX or Centrex Service for Internet devices. More specifically, each

server cluster 111 may be viewed as operating as a PBX/Centrex service for Internet devices which access the cluster via the Internet. By providing server clusters 111 accessible by Internet devices via the Internet, the Internet in combination with a server cluster provides switching functionality for Internet devices allowing Incoming calls to be directed to specific Internet devices at a common geographic location or area or areas.

The architecture of certain embodiments of the system as described herein is readily expandable to permit additional servers to be added to provide additional features. The use of Sequel servers SQL1, SQL2 permits directories or memories to be provided for the storage of voice and/or video mail for registered users who are not logged on to the Internet. FIG. 17 illustrates the addition of additional features to a cluster 111 to permit the addition of voice and video mail. Mass memory 1701, 1702 is provided for the storage of voice and video messages. Operation of the mass memories 1701, 1702 for storage of messages is under control of the sequel servers SQLI, SQL2. In addition, servers SQL1, SQL2 are utilized to provide for video conferencing by directing conference calls to existing video conference providers. This arrangement is utilized in conjunction with the dynamic/permanent directory aspect of the system described above. In the event that a user of the system desires to communicate with another registered user, but that registered user is does not respond to attempts to connect to him or her, or if the called registrant is not currently on the Internet as indicated by the merged dynamic and permanent directories, a voice mail or video mail message may be left for the called registrant. The message is stored by the sequel servers SQL1 or SQL2 at a voice mail/ video mail messaging site.

In a virtual mall in accordance with other embodiments as described herein, at least two levels are provided. The first level is a downtown area which has a corporate skyline in which purchases of goods and services may made. When the user desires to order a product from a company, say computer manufacturer "D," the user "clicks" on the "D" icon. In the past the result would be an Internet hyperlink connection to D's Internet site. In the past, when a potential customer logged on to an Internet site such as this one, the user was unassisted and would

enter all information and purchase the product. E-commerce (as it has been popularly referred to) generally eliminates an important aspect of conventional non-Internet commerce, in that no ability is provided for interactive selling to a customer or "up-selling" a customer with additional options or features. In accordance with the invention, when the user clicks on the "D" icon an Internet call is launched. The call brings up a service agent from "D" who engages the user into a sales based conversation. The service agent can bring information to the customer. The agent can provide assisted browsing or bring the information to a "white board" and send data to the customer that can help the customer purchase the right product to fit the customer's needs. The agent can provide other interactive services such as offering a credit account, sending a credit application to the customer, and closing the credit application. In accordance with the present invention, the customer and agent can view each other with an Internet video camera simultaneous with the conversation or the customer can use an avatar or otherwise not disclose his or her physical identity. However, in certain instances, the agent may require that the customer un-block the avatar and view a real video of the customer to, for example, visually verify that the customer is an adult. Other customer identity verification information may be used such as a digital signature or the use of biometrics information such as a fingerprint scan or voice identifier or other verifier of identity. The registration process for obtaining a permanent communication number preferably requires that the registrant disclose his or her age. By knowing the registrants age, a system in accordance with the invention can provide a reasonable basis for determining that the user or customer is of legal age.

FIG.18 illustrates a process of Internet selling in accordance with one or more embodiments as disclosed herein. According to the process illustrated in FIG. 18, after the user has accessed the web site at step 1801, the user may browse through various product or service categories. When the user identifies a product or service that he or she either desires to purchase or desires to obtain more information about, the user may click on an "order" icon to indicate the desire as indicated at step 1803. By clicking on the icon, a video link connection

is established via the Internet 51 to a sales agent site, shown in FIG. 10 as service center 1050. At service center 1050, sales agents are available to interact in real time with customers via the Internet link connection. A salesperson or a sales agent offers at step 1807 to assist the customer and provides assistance, by, for example, suggesting additional items related to the item or service that the customer is interested in or by offering special sales and the like. When the sale is substantially complete, the sales person takes the order or verifies the order entered by the customer at step 1809. As part of the process, the salesman may at step 1811 verify the age of the customer, if for example the customer is attempting to purchase "adults only" goods. If the customer is not an appropriate age, the sale is denied and the link connection to the customer is terminated at step 1813. In some instances, an informational message may also be provided to the potential customer. If the age verification step indicates that the customer is of the appropriate age, the salesperson also verifies the customers identity or credit card information as indicated at step 1815. After the identity is verified, the order is confirmed as indicated at step 1817.

One advantage of the connection to a service agent is that the result is a blend of the advanced technology of the world wide web and the time tested and important use of individuals as sales people to assist in the offering of merchandise and services and the sale of add on products, features or options by using persuasive sales techniques which have heretofore been missing on the use of the Internet as a medium of commerce.

The invention has been described in conjunction with specific illustrative embodiments thereof. It will be understood that various modifications may be made without departing from the spirit or scope of the invention. It is intended that the scope of protection afforded the invention disclosed herein includes all such modifications and variations. It is intended that the illustrative embodiment not limit the scope of the invention in any way and that the invention be limited in scope only in accordance with the claims appended hereto. It will also be understood that although various embodiments are primarily described in conjunction with the Internet, the principles are equally applicable to other

distributed electronic networks, including modifications, enhancements or substitutes for the Internet as it exists today.

CLAIMS

What is claimed is:

1. A method for facilitating communication over a distributed electronic network, comprising the steps of:

receiving, at a web site, a communication request over a distributed electronic network from an electronic device, said communication request comprising a permanent communication number of an intended receiving device;

retrieving an Internet protocol (IP) address for the intended receiving device from a cross-index of permanent communication numbers and IP addresses; and

routing the communication request to the intended receiving device based upon its IP address.

2. The method of claim 1, wherein said cross-index of permanent communication numbers and IP addresses is stored in a database at said web site, said method further comprising the step of retrieving an on-line status indication of the intended receiving device from said database.

3. The method of claim 2, wherein said database comprises a dynamic portion and a permanent portion, said on-line status indication of the intended receiving device being stored in the dynamic portion of said database.

4. The method of claim 1, wherein said step of routing the communication request to the intended receiving device based upon its IP address comprises the step of sending the IP address of the intended receiving device to said electronic device from which said communication request was received.

5. A system for facilitating communication over a distributed electronic network, comprising:

a web server for receiving communication requests over the distributed electronic network from electronic devices, each of said communication requests comprising a permanent communication number; and

a table accessible to said web server, said table comprising a list of permanent communication numbers and associated IP addresses;

wherein, in response to said communication requests, said web server accesses said table to retrieve the IP address associated with each permanent communication number, and routes communication between the requesting electronic device and the intended receiving device based upon the retrieved IP address.

6. An Internet communications portal, comprising:

a router coupled to the Internet;

at least one director switch linked to said router,

at least one enterprise switch linked to said at least one director switch;

a plurality of servers each linked to said at least one enterprise switch;

at least one dynamic directory linked to one server of said plurality of servers;

at least one permanent directory linked to another one server of said plurality of servers;

at least one of said plurality of servers merging said dynamic and said permanent directories.

7. An Internet device, comprising:

processor,

memory coupled to said processor,

link to couple to the Internet;

said memory containing a first identification code to identify said Internet device and a second identification code to identify a user of said Internet device, said processor causing said first and second identification codes to be transmitted to an Internet server.

8. An Internet communications portal, said portal comprising:

a router coupled to the Internet;

a director switch linked to said router;

an enterprise switch linked to said director switch;

a plurality of servers linked to said enterprise switch;

a dynamic directory associated with a first one of said plurality of servers, said dynamic directory configured to provide a list of on-line users; and

a permanent directory associated with a second one of said plurality of servers, and permanent directory configured to provide a list of registered users, wherein one of said plurality of servers merging said dynamic and said permanent directories.

9. A distributed system for communicating over a packet-switched network, said system comprising:

a plurality of Internet communication devices configured to allow communication over said packet-switched network by a plurality of users, each of said Internet communication devices including a processor, a memory coupled to said processor, and a data link coupled to the packet-switched network, wherein said memory contains a first identification code unique to said Internet communication device, and a second identification code unique to a user of said Internet communication device, said processor operable to transmit said first and second identification codes through said data link to the packet-switched network;

an IP central office coupled to said packet-switched network, said IP central office comprising:

a dynamic directory, said dynamic directory configured to provide a list of said users who are on-line with said Internet communication devices in accordance with said first and second identification codes transmitted by said Internet communication devices;

a permanent directory, said permanent directory configured to provide a list of registered users of said Internet communication devices;

a processor operable to receive said first and second identification codes transmitted from said Internet communication devices;

wherein said Internet communication devices are configured to periodically communicate with said IP central office to indicate on-line status.

10. The system of claim 9, wherein at least one of said Internet communication devices is configured to conform to the H.323 specification.

11. A distributed system for communicating over a packet-switched network, said system comprising:

a plurality of Internet communication devices configured to allow communication over said packet-switched network by a plurality of users, each of said Internet communication devices including a processor, a memory coupled to said processor, and a data link coupled to the packet-switched network, wherein said memory contains a first identification code unique to said Internet communication device, and a second identification code unique to a user of said Internet communication device, said processor operable to transmit said first and second identification codes through said data link to the packet-switched network;

an IP central office coupled to said packet-switched network, said IP central office comprising:

a dynamic directory, said dynamic directory configured to provide a list of said users who are on-line with said Internet communication devices in accordance with said first and second identification codes transmitted by said Internet communication devices;

a permanent directory, said permanent directory configured to provide a list of registered users of said Internet communication devices;

a processor operable to receive said first and second identification codes transmitted from said Internet communication devices;

a database configured to store communications from a first user to a second user listed in said permanent directory;

wherein said Internet communication devices are configured to periodically communicate with said IP central office to indicate on-line status.

12. The system of claim 11, wherein said stored communication comprises a video message from said first user.

13. The system of claim 11, wherein said stored communication comprises an audio message from said first user.

14. A method of transacting business over a global computer network utilizing a standardized protocol, said method comprising the steps of:

providing a first web site accessible by a user over the global computer network;

receiving over the global computer network, order request information from said user;

connecting said user to a salesperson to establish a communication path between said user and said salesperson;

providing up-selling information to said user;

modifying said order request information in accordance with said step of providing up-selling information.

15. A method in accordance with claim 14, wherein said communication path includes at least a video path from said salesperson to said user.

16. A method for transacting business over a global computer network utilizing standardized protocols, said method comprising the steps of:

providing a web site accessible by a user over the global computer network, said web site having at least on icon disposed thereon for access by the user;

identifying when said user clicks on said icon;

responding to said shopper clicking on said icon by launching a call to a service agent;

using said agent to provide said user with assisted browsing.

17. A method in accordance with claim 16, further including the step of: obtaining from said shopper a digital signature in order to close an order received from said shopper.

18. A method in accordance with claim 16, further including the step of: verifying the identify of said user.

19. A method in accordance with claim 16, wherein said agent is connected to said shopper by at least one of text, audio, and video.

20. A method in accordance with claim 16, further comprising the steps of:

providing a virtual mall accessible by said user and displayed via said web site;

providing images of said users engaged in activities in said virtual mall.

21. An Internet communication device for communicating over a global computer network, said Internet communication device comprising:

a processor;

a memory coupled to said processor;

a data link coupled to the global computer network;

said memory containing a first identification code unique to the Internet communication device, and a second identification code unique to a user of said Internet communication device;

said processor operable to transmit said first and second identification codes through said data link to a server accessible over the global computer network.

22. The Internet communication device of claim 21, wherein said second identification code is a twelve-digit integer having the form xyyyyyyyyyyy, where x represents a number from 2 to 9, and y represents a number from 0 to 9.

23. The Internet communication device of claim 21, wherein said first identification code corresponds to an IP address associated with said Internet communication device.

24. The Internet communication device of claim 21, wherein said server includes a dynamic directory and a permanent directory.

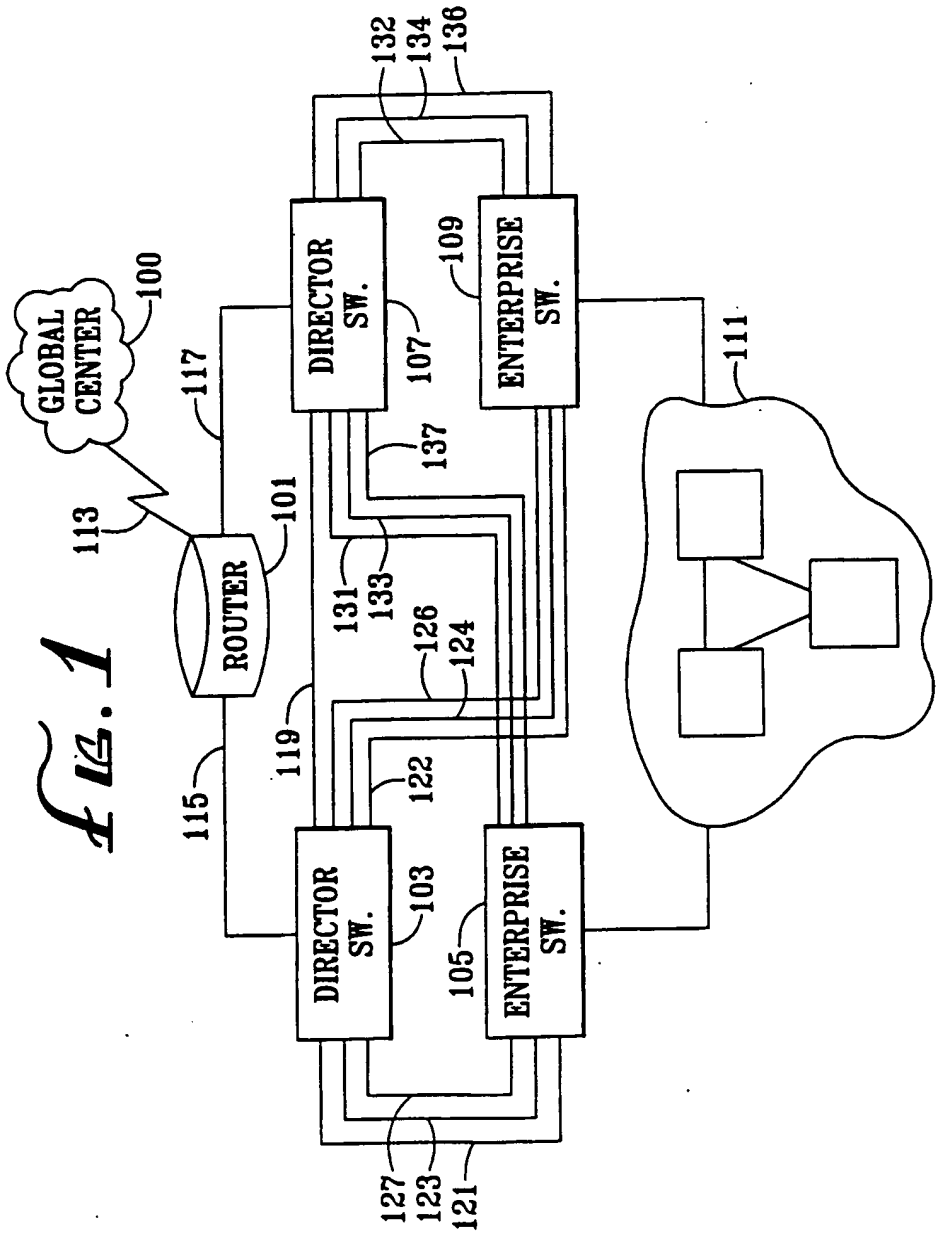

GLOBAL CENTER
100
117
113
ROUTER
101
DIRECTOR SW.
107
ENTERPRISE SW.
109
111
132
134
136
137
131
133
126
124
119
115
122
DIRECTOR SW.
103
ENTERPRISE SW.
105
127
123
121

Fig. 1

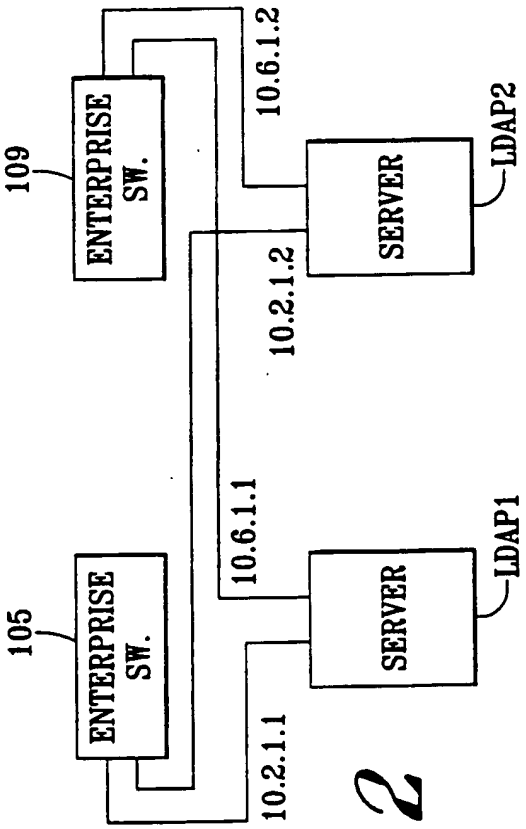
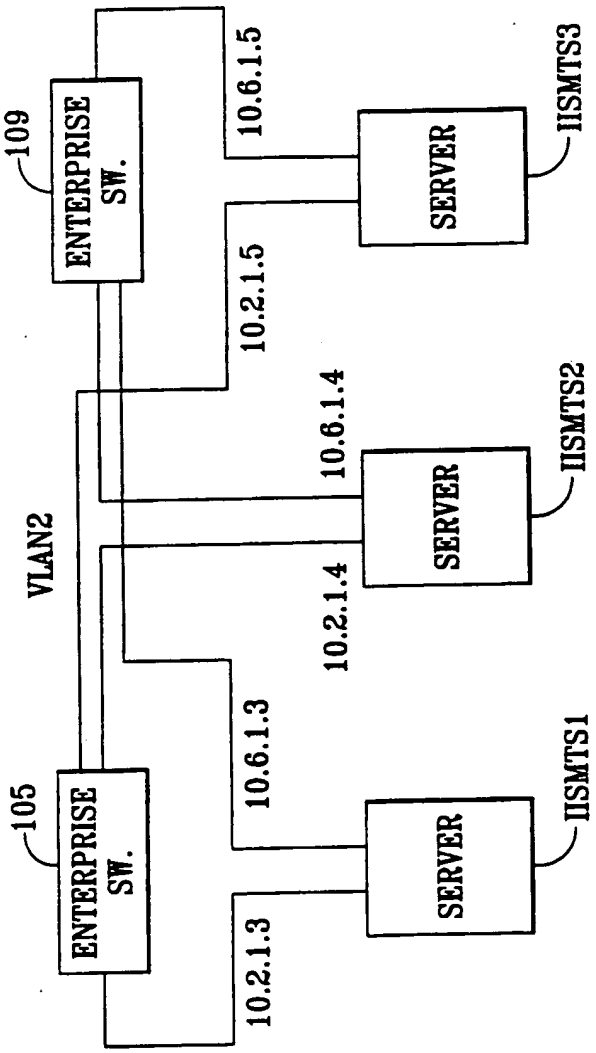

109
ENTERPRISE SW.
105
ENTERPRISE SW.
10.6.1.2
10.2.1.2
10.6.1.1
10.2.1.1
SERVER
LDAP2
SERVER
LDAP1

Fig. 2

FIG. 3


109
ENTERPRISE SW.
105
ENTERPRISE SW.
VLAN2
10.6.1.5
10.2.1.5
10.6.1.4
10.2.1.4
10.6.1.3
10.2.1.3
SERVER
IISMTS3
SERVER
IISMTS2
SERVER
IISMTS1

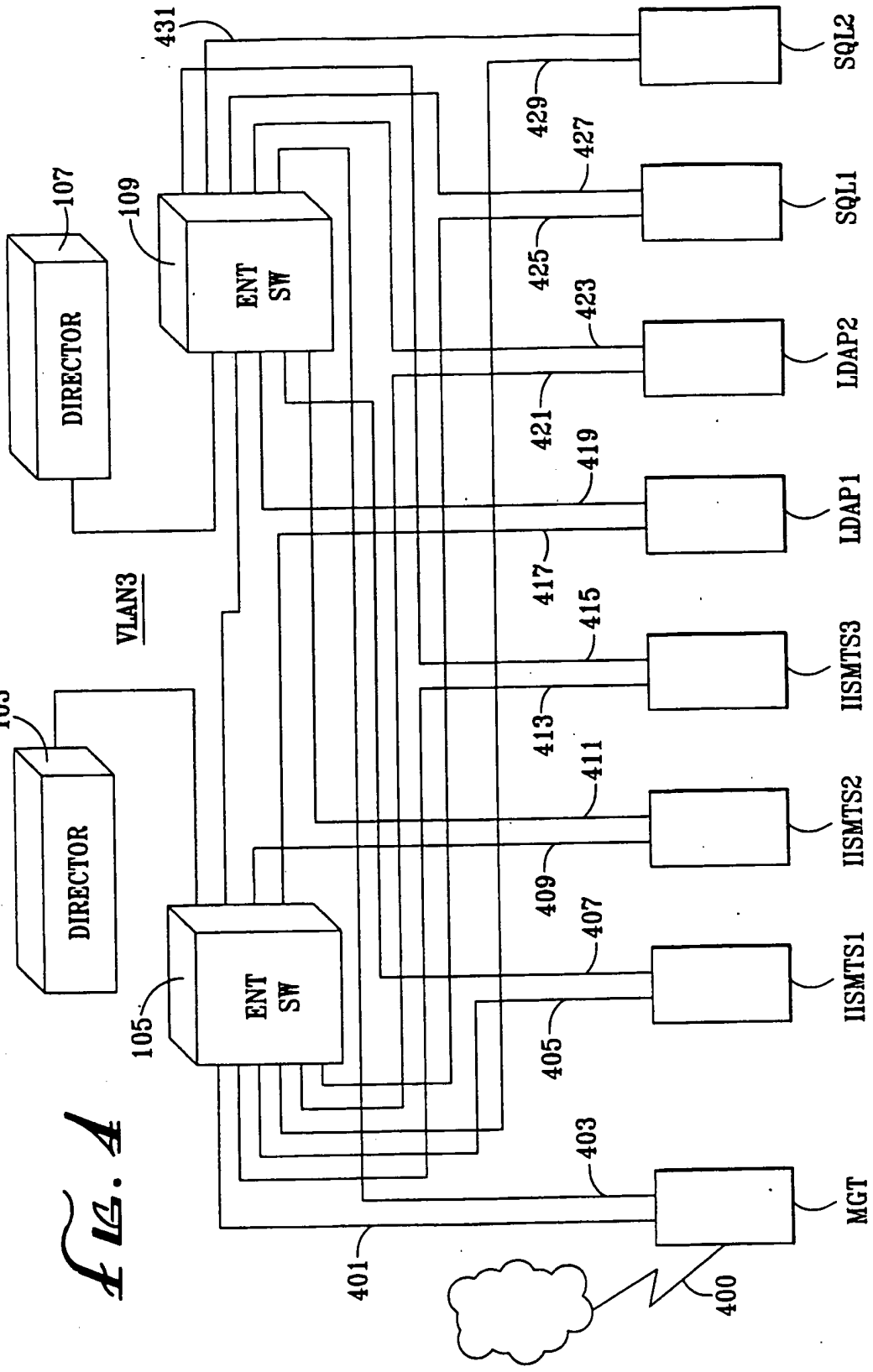

431
SQL2
429
427
SQL1
107
109
425
423
LDAP2
DIRECTOR
ENT SW
421
419
LDAP1
417
VLAN3
415
IISMTS3
103
413
411
IISMTS2
DIRECTOR
409
407
IISMTS1
105
ENT SW
405
403
MGT
401
400

FIG. 4

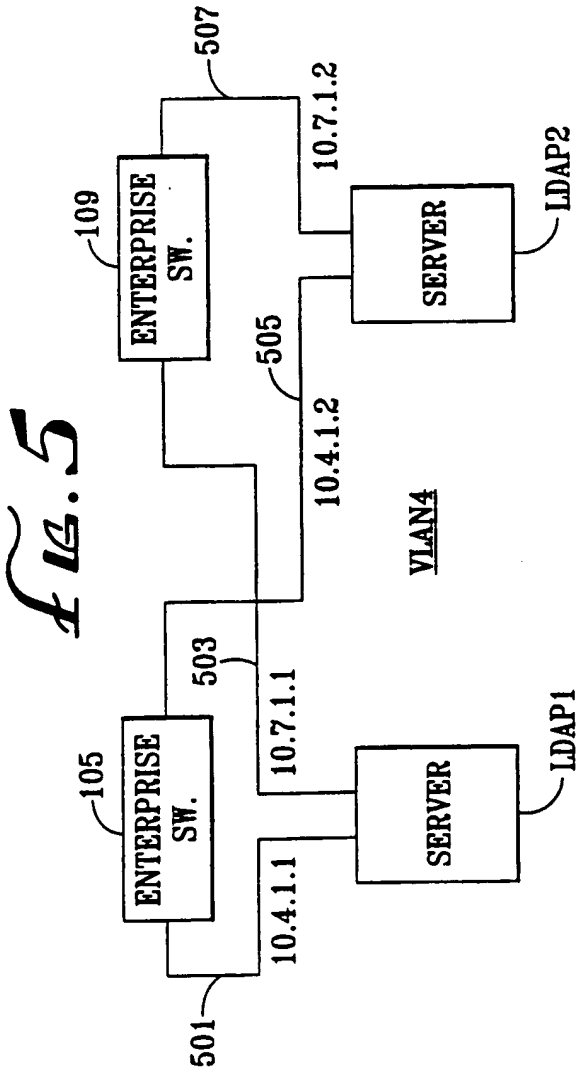

507
10.7.1.2
109
ENTERPRISE SW.
SERVER
LDAP2
505
10.4.1.2
VLAN4
503
10.7.1.1
105
ENTERPRISE SW.
SERVER
LDAP1
10.4.1.1
501

Fig. 5

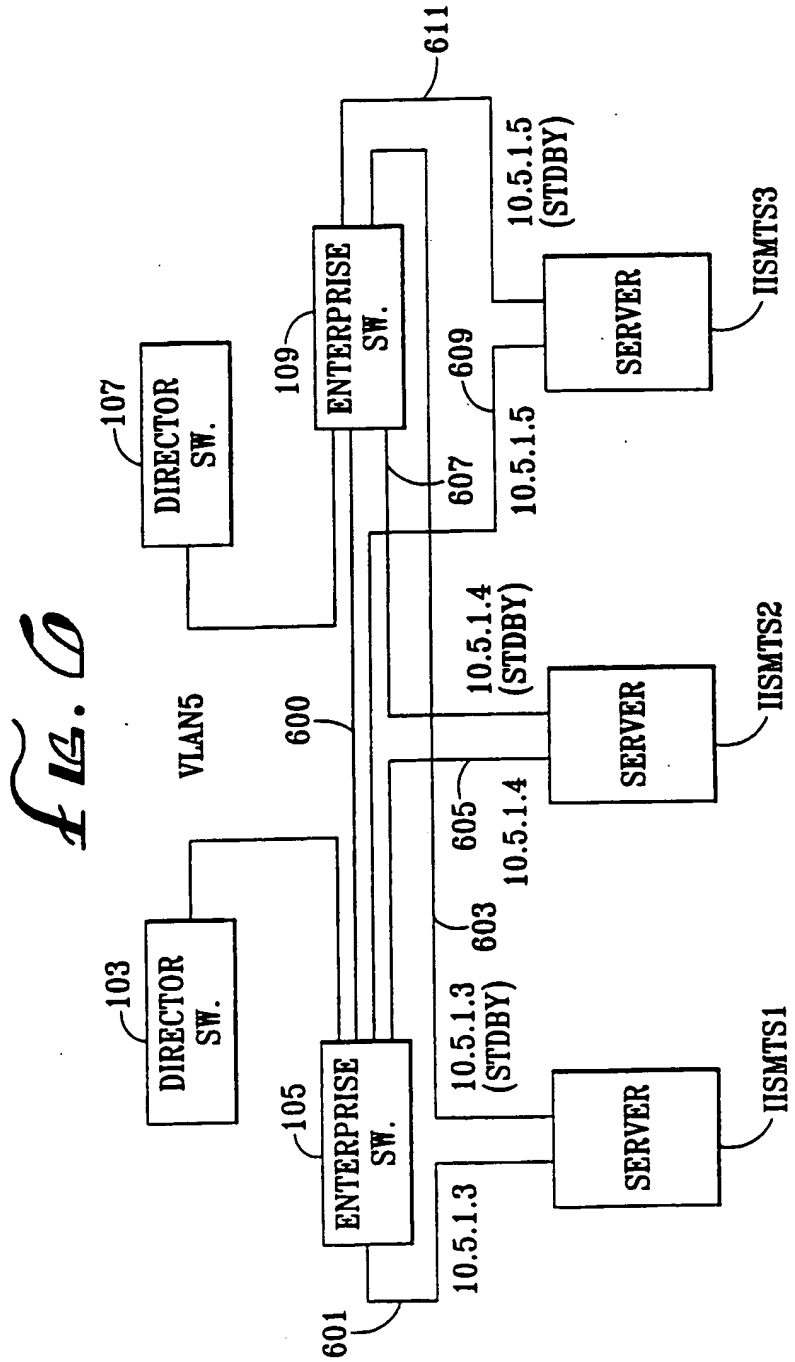

611
10.5.1.5
(STDBY)
IISMTS3
SERVER
109
ENTERPRISE
SW.
609
10.5.1.5
107
DIRECTOR
SW.
607
10.5.1.4
(STDBY)
IISMTS2
SERVER
VLAN5
600
605
10.5.1.4
603
10.5.1.3
(STDBY)
103
DIRECTOR
SW.
105
ENTERPRISE
SW.
IISMTS1
SERVER
10.5.1.3
601

FIG. 6

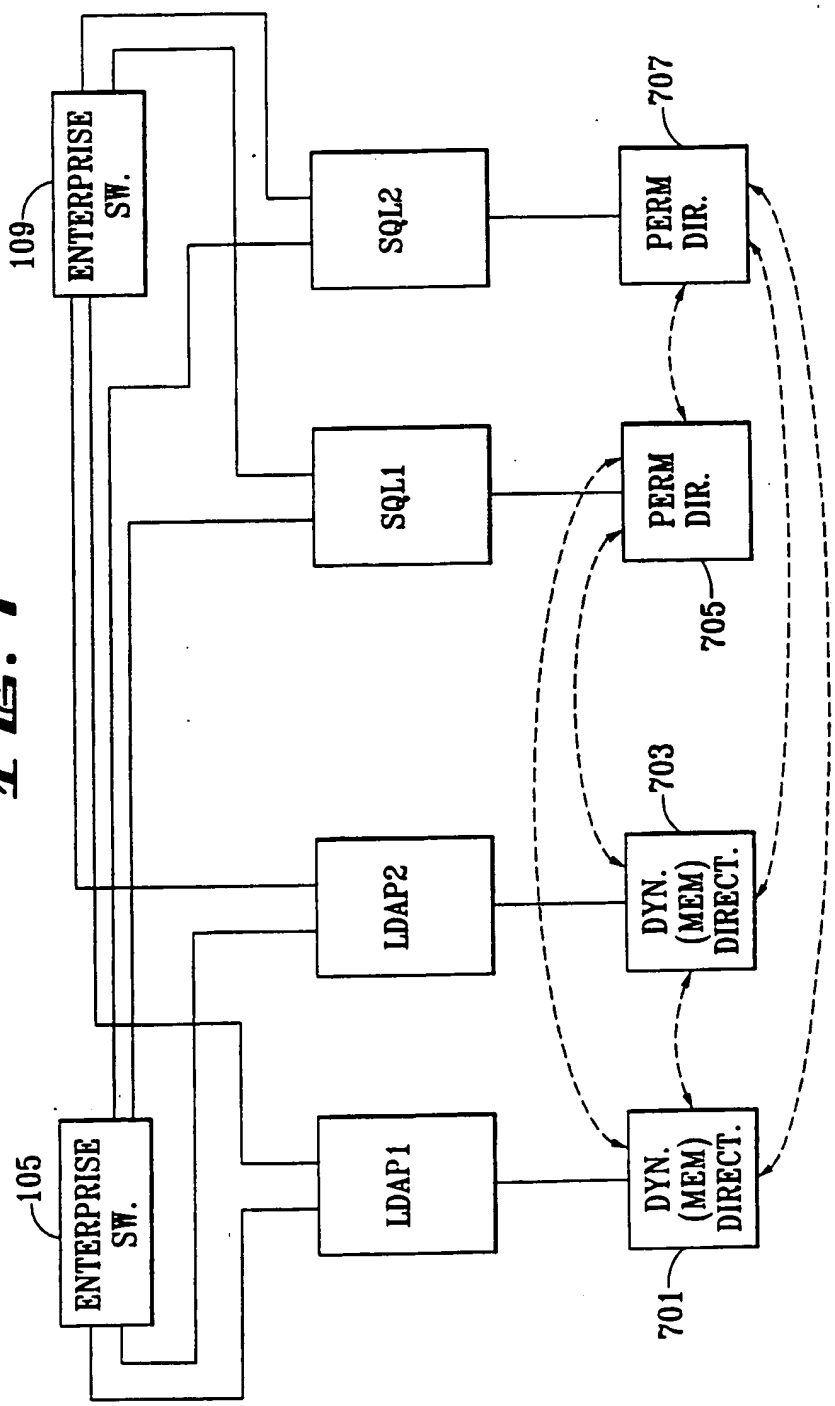

ENTERPRISE SW.
109
SQL2
PERM DIR.
707
SQL1
PERM DIR.
705
LDAP2
DYN. (MEM) DIRECT.
703
ENTERPRISE SW.
105
LDAP1
DYN. (MEM) DIRECT.
701

Fig. 7

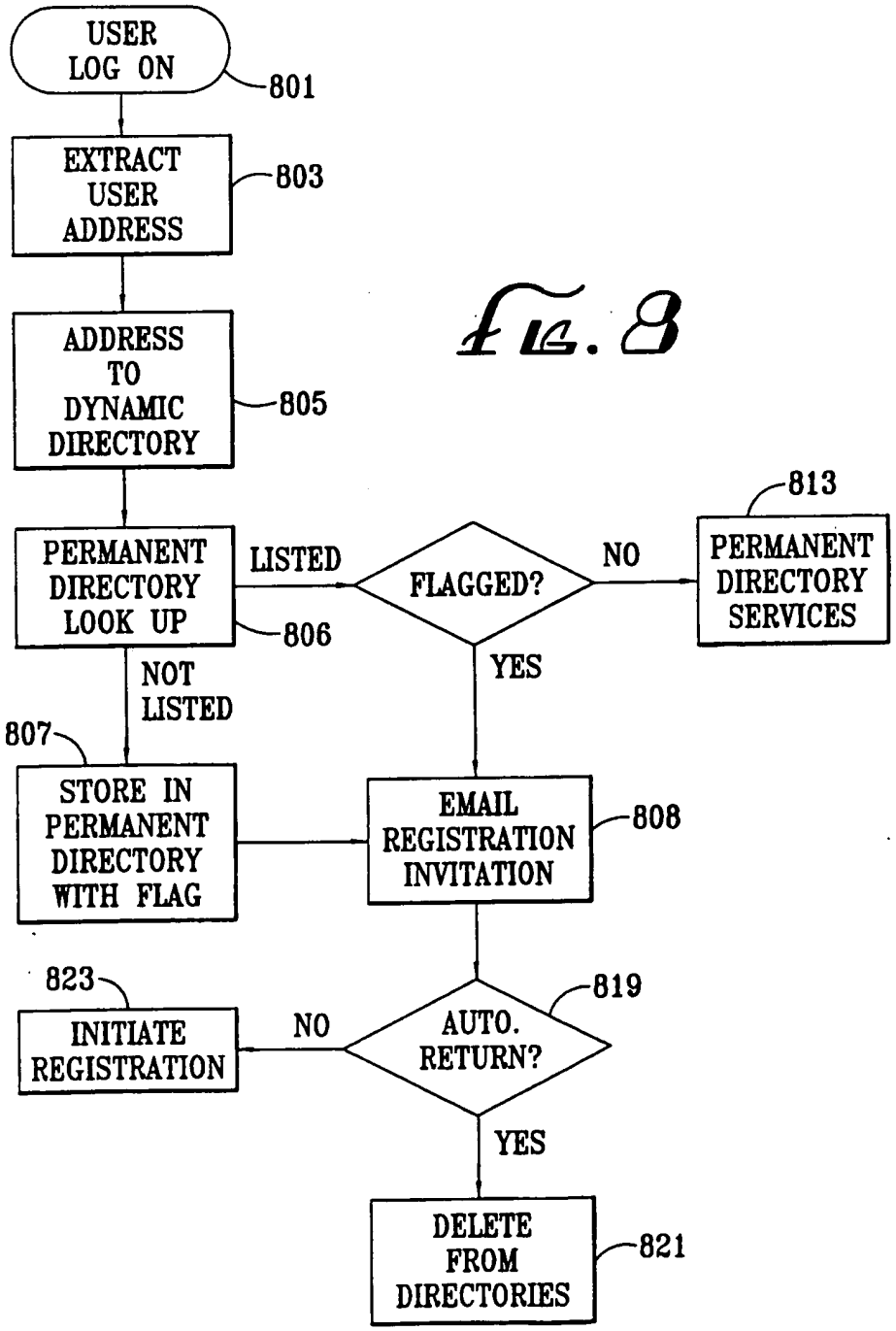

USER LOG ON
801
EXTRACT USER ADDRESS
803
ADDRESS TO DYNAMIC DIRECTORY
805
PERMANENT DIRECTORY LOOK UP
806
LISTED
FLAGGED?
NO
813
PERMANENT DIRECTORY SERVICES
YES
NOT LISTED
807
STORE IN PERMANENT DIRECTORY WITH FLAG
EMAIL REGISTRATION INVITATION
808
823
INITIATE REGISTRATION
NO
AUTO. RETURN?
819
YES
DELETE FROM DIRECTORIES
821

FIG. 8

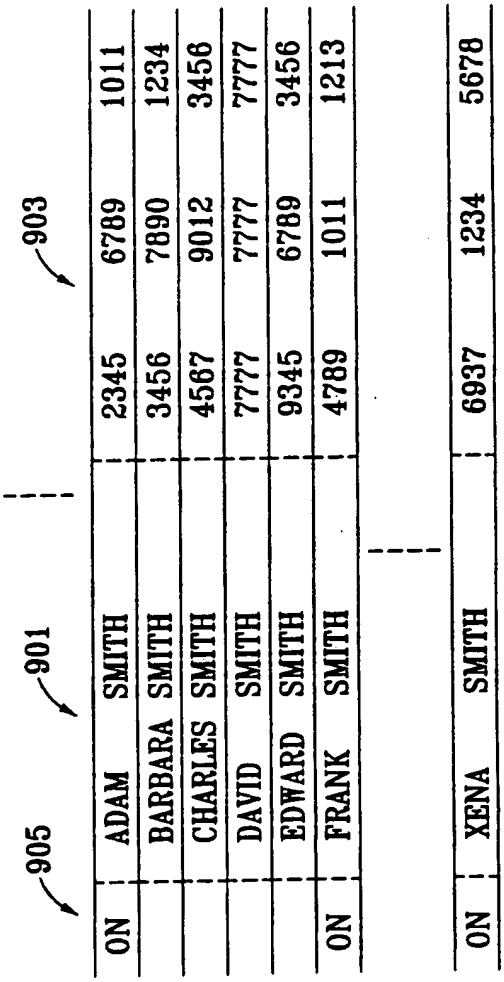

905
901
903
ON ADAM SMITH 2345 6789 1011
BARBARA SMITH 3456 7890 1234
CHARLES SMITH 4567 9012 3456
DAVID SMITH 7777 7777 7777
EDWARD SMITH 9345 6789 3456
ON FRANK SMITH 4789 1011 1213
ON XENA SMITH 6937 1234 5678

Fig. 9

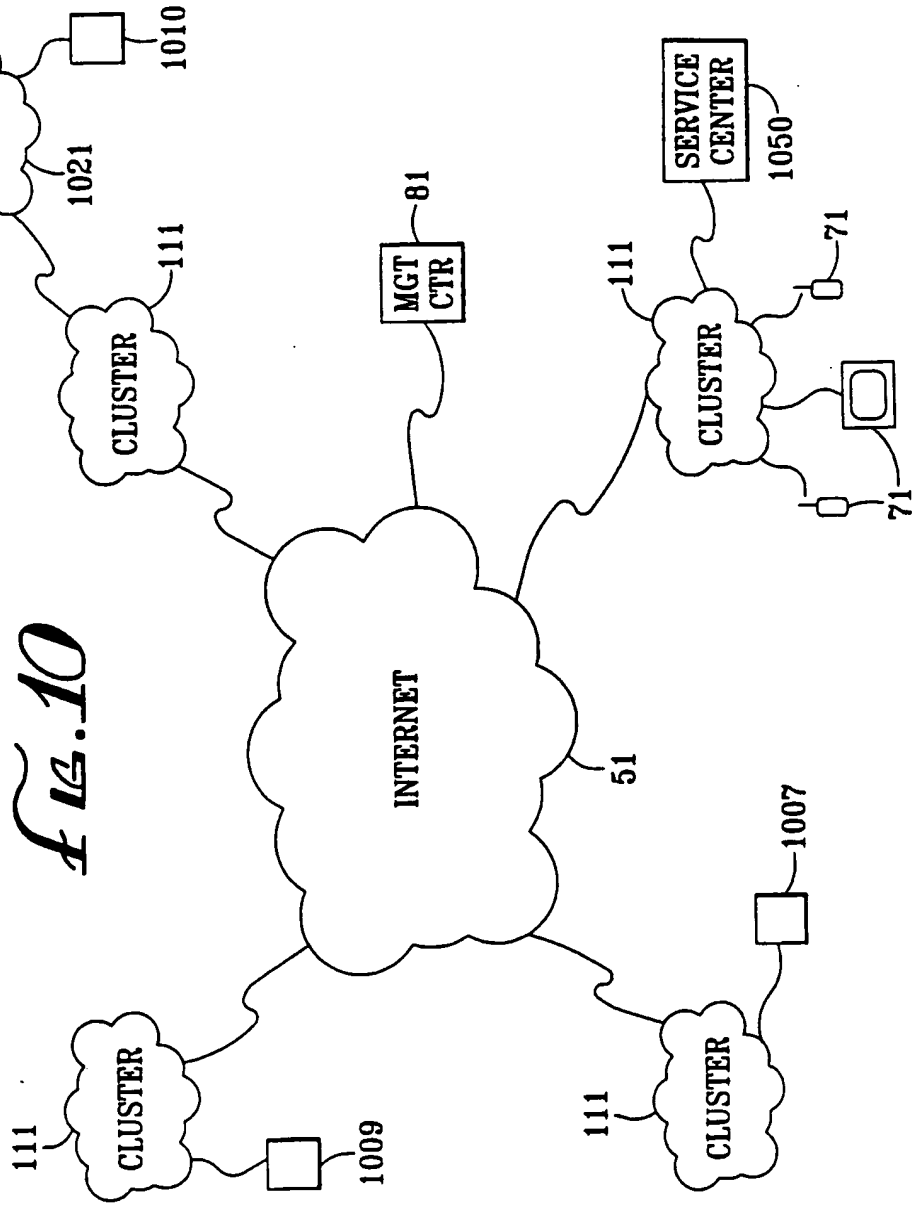

PSN
1010
1021
CLUSTER
111
MGT CTR
81
SERVICE CENTER
1050
CLUSTER
111
71
71
INTERNET
51
CLUSTER
111
1009
CLUSTER
111
1007

Fig. 10

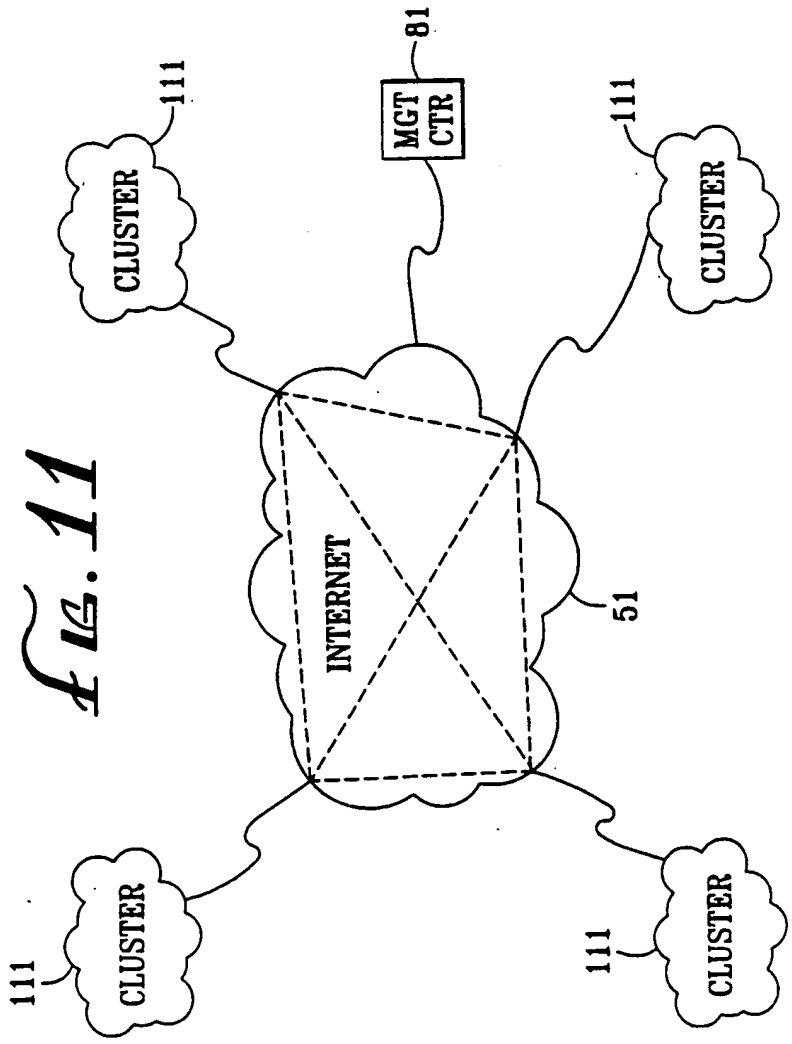

81
MGT CTR
111
CLUSTER
111
CLUSTER
INTERNET
51
111
CLUSTER
111
CLUSTER

Fig. 11

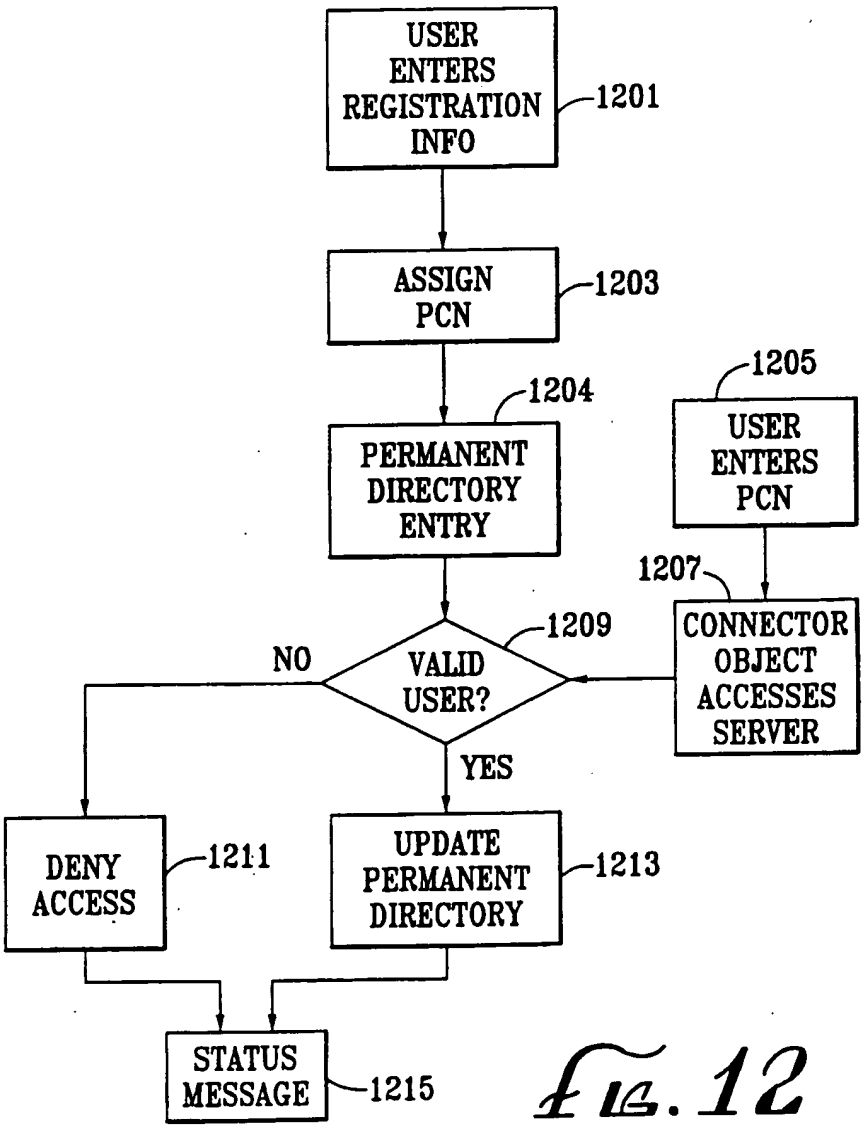

USER ENTERS REGISTRATION INFO
1201
ASSIGN PCN
1203
PERMANENT DIRECTORY ENTRY
1204
USER ENTERS PCN
1205
CONNECTOR OBJECT ACCESSES SERVER
1207
VALID USER?
1209
NO
YES
DENY ACCESS
1211
UPDATE PERMANENT DIRECTORY
1213
STATUS MESSAGE
1215

FIG. 12

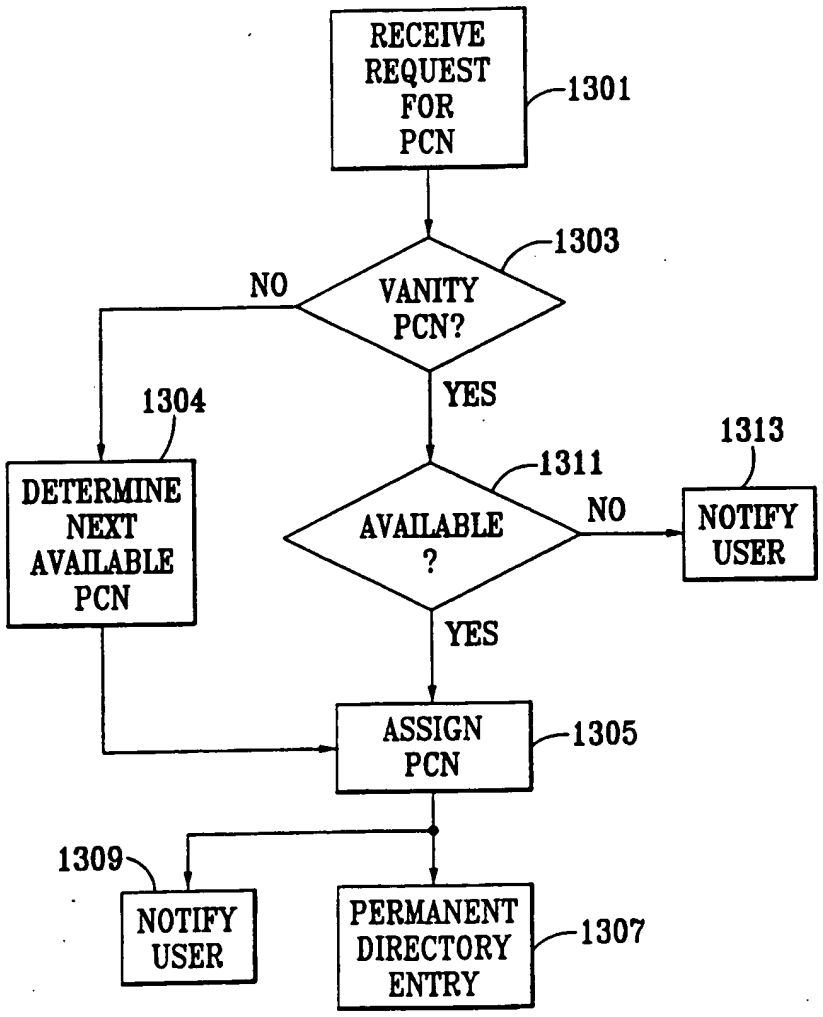

RECEIVE REQUEST FOR PCN
1301
1303
VANITY PCN?
NO
YES
1304
DETERMINE NEXT AVAILABLE PCN
1311
AVAILABLE ?
NO
1313
NOTIFY USER
YES
ASSIGN PCN
1305
1309
NOTIFY USER
PERMANENT DIRECTORY ENTRY
1307

FIG. 13

FIG. 14

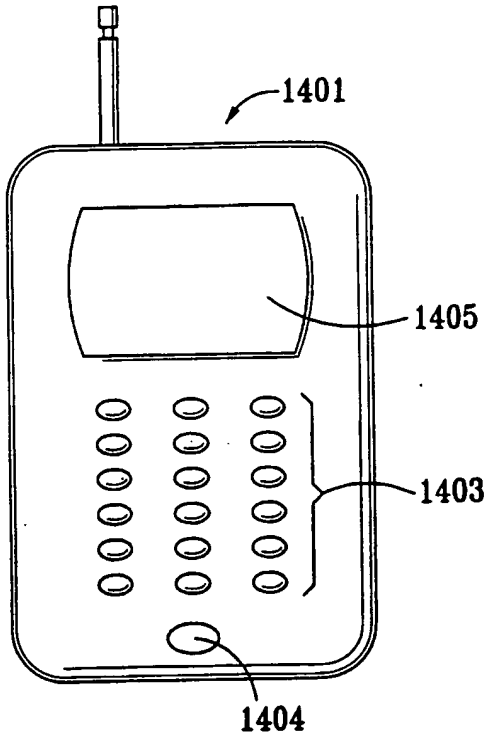
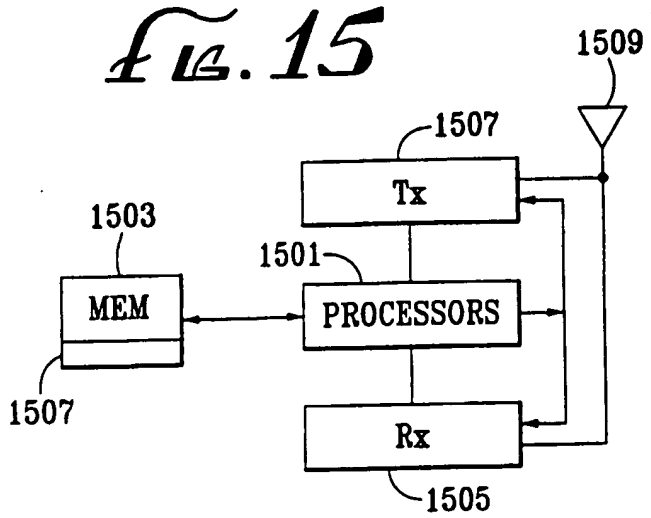

1401
1405
1403
1404

FIG. 15


1509
1507
Tx
1503
1501
MEM
PROCESSORS
1507
Rx
1505

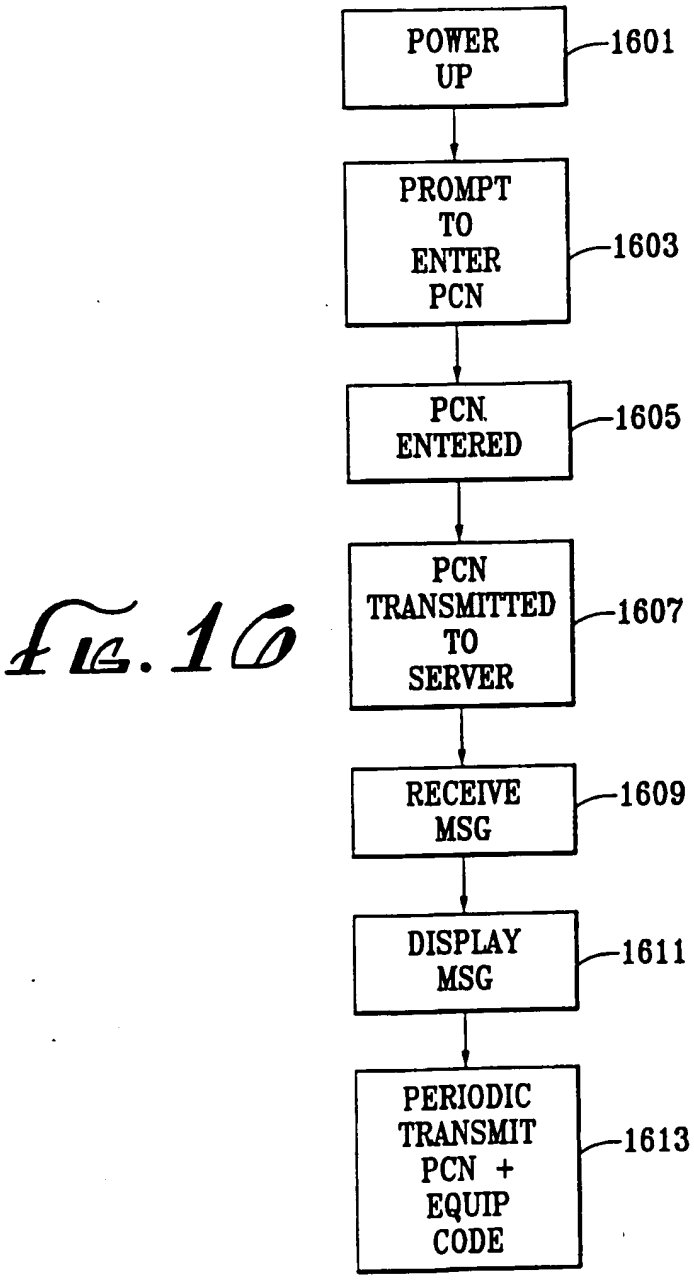

POWER UP
1601
PROMPT TO ENTER PCN
1603
PCN ENTERED
1605
PCN TRANSMITTED TO SERVER
1607
RECEIVE MSG
1609
DISPLAY MSG
1611
PERIODIC TRANSMIT PCN + EQUIP CODE
1613

Fig. 16

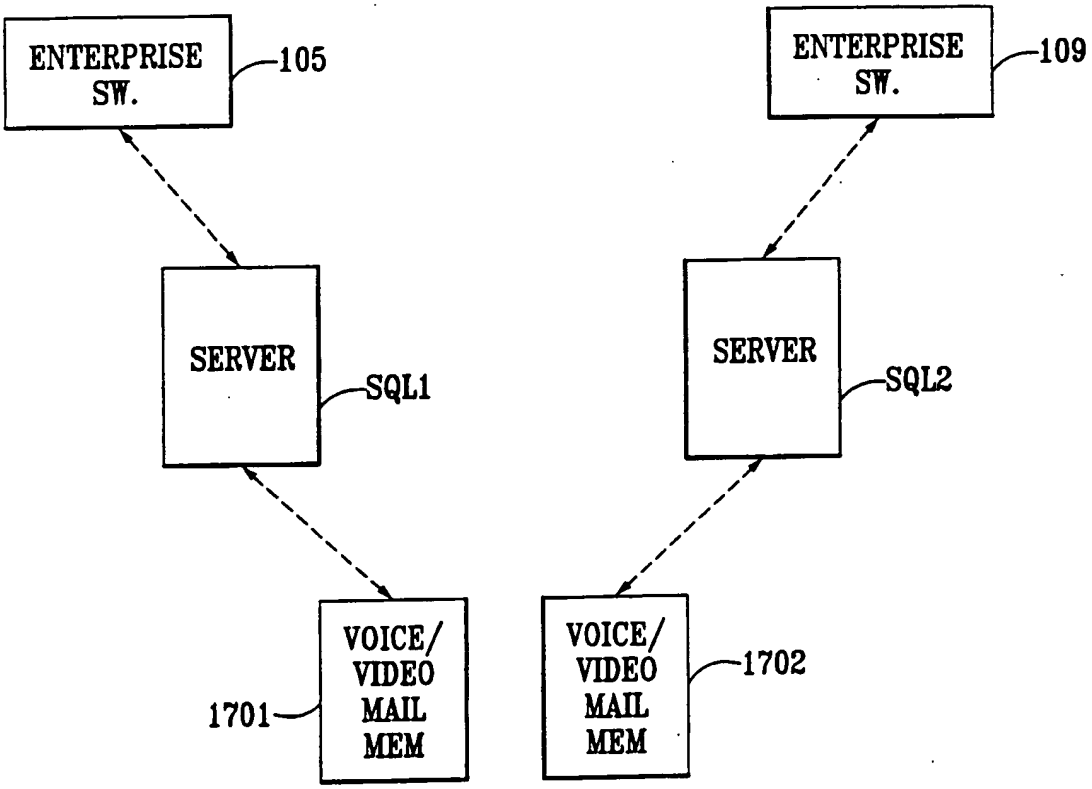

ENTERPRISE SW.
105
ENTERPRISE SW.
109
SERVER
SQL1
SERVER
SQL2
VOICE/ VIDEO MAIL MEM
1701
VOICE/ VIDEO MAIL MEM
1702

Fig. 17

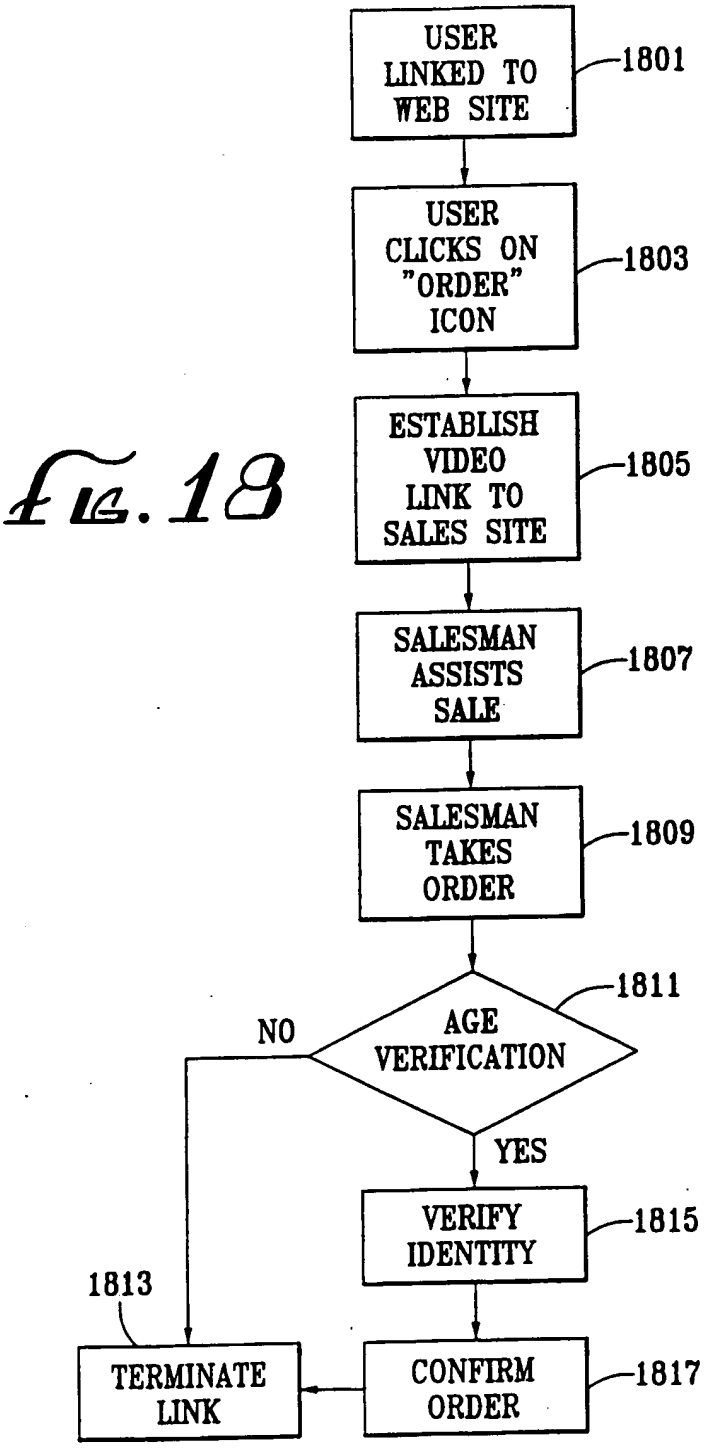

USER LINKED TO WEB SITE
1801
USER CLICKS ON "ORDER" ICON
1803
ESTABLISH VIDEO LINK TO SALES SITE
1805
SALESMAN ASSISTS SALE
1807
SALESMAN TAKES ORDER
1809
AGE VERIFICATION
1811
NO
YES
VERIFY IDENTITY
1815
1813
TERMINATE LINK
CONFIRM ORDER
1817

FIG. 18

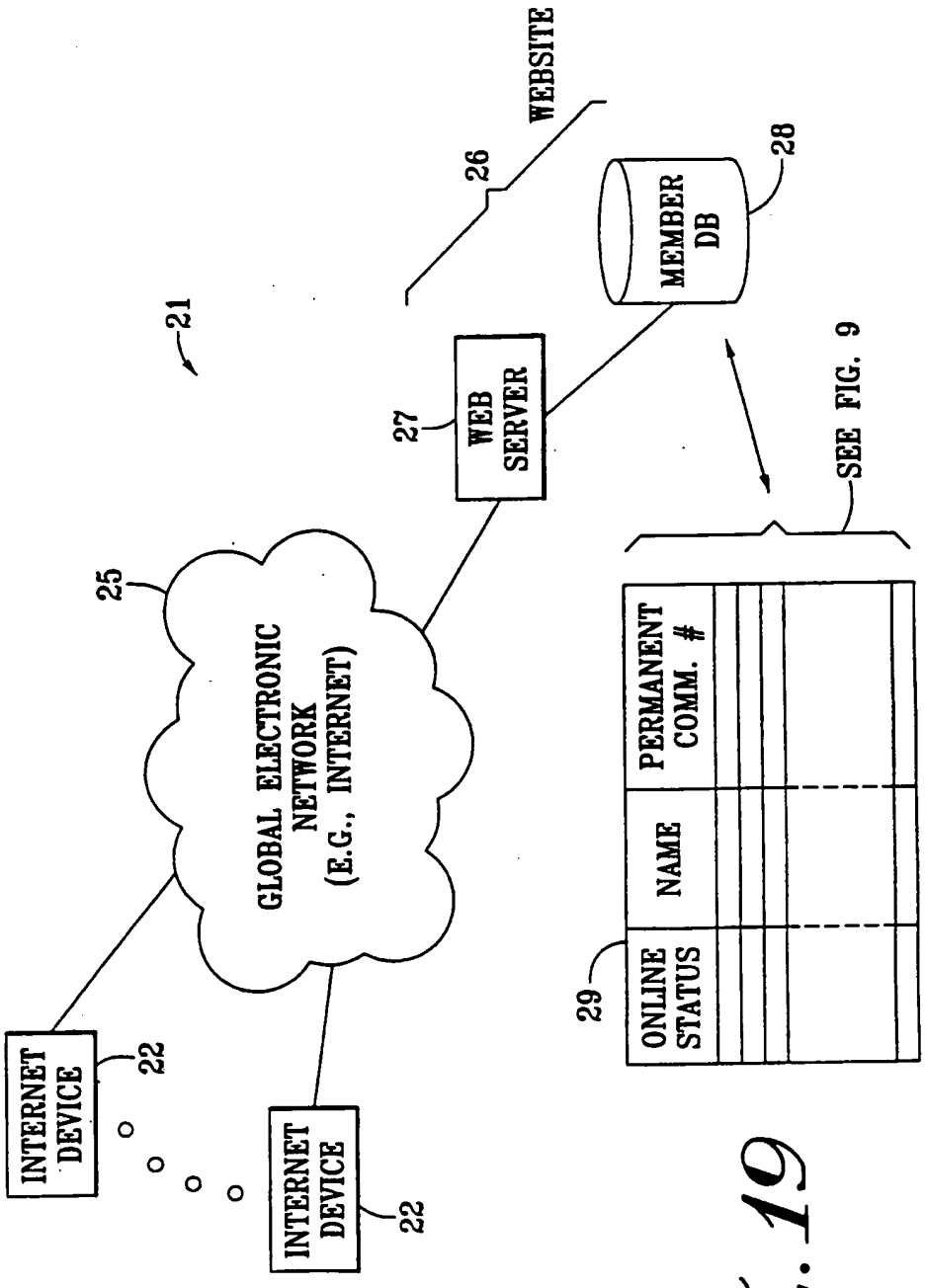

WEBSITE
26
21
MEMBER DB
28
WEB SERVER
27
SEE FIG. 9
25
GLOBAL ELECTRONIC NETWORK (E.G., INTERNET)
INTERNET DEVICE
22
INTERNET DEVICE
22
29
ONLINE STATUS
NAME
PERMANENT COMM. #

Fig. 19

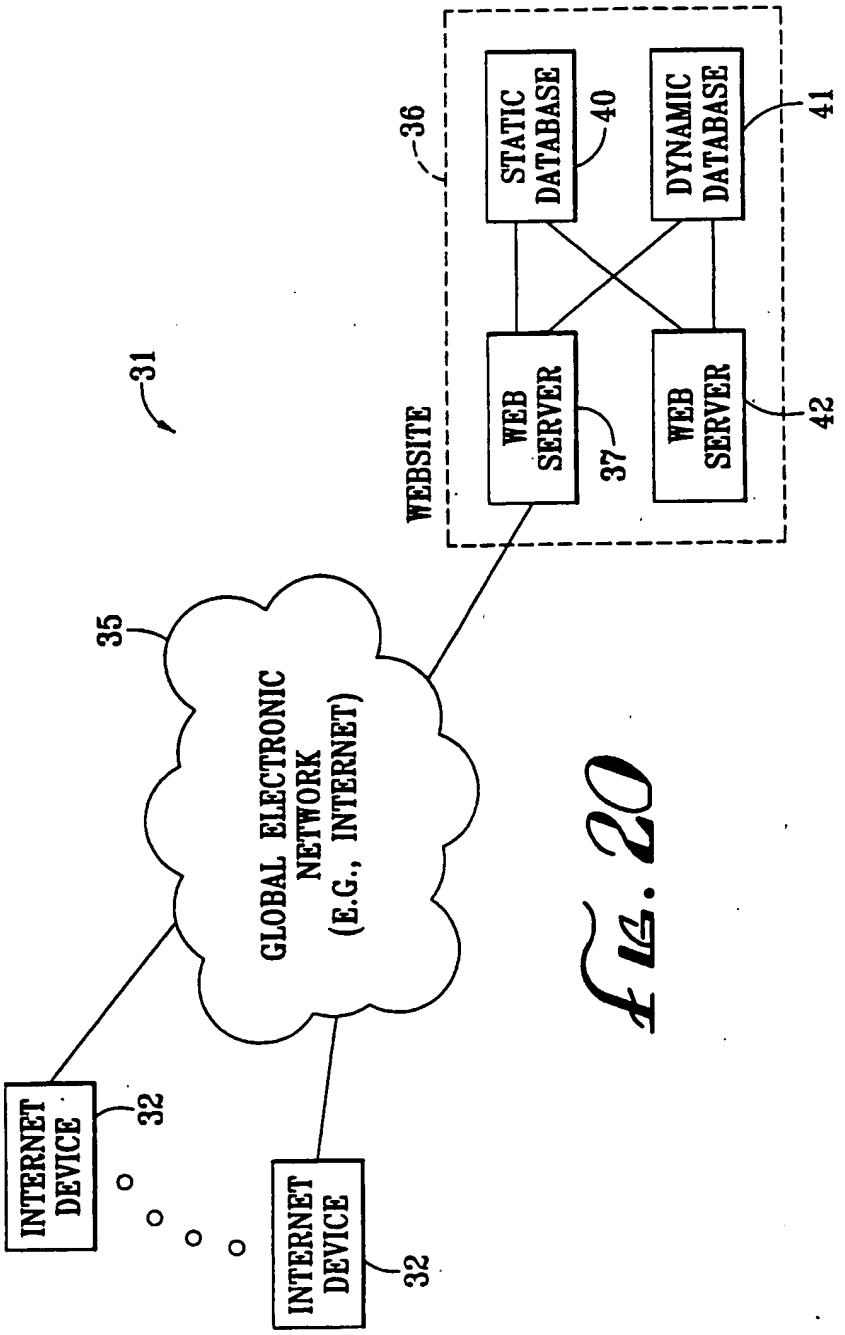

31
35
GLOBAL ELECTRONIC NETWORK (E.G., INTERNET)
INTERNET DEVICE
32
INTERNET DEVICE
32
36
WEBSITE
WEB SERVER
37
WEB SERVER
42
STATIC DATABASE
40
DYNAMIC DATABASE
41

Fig. 20

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
16 November 2000 (16.11.2000)

PCT

(10) International Publication Number
WO 00/69143 A3

(51) International Patent Classification[7]: H04L 29/12, 12/58

(21) International Application Number: PCT/US00/12908

(22) International Filing Date: 11 May 2000 (11.05.2000)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
09/309,963 11 May 1999 (11.05.1999) US

(71) Applicant *(for all designated States except US)*: VISITALK.COM, INC. [US/US]; 6135 North 7th Street, Phoenix, AZ 85014 (US).

(72) Inventor; and
(75) Inventor/Applicant *(for US only)*: THIMMESCH, Peter [US/US]; 6135 North 7th Street, Phoenix, AZ 85014 (US).

(74) Agents: VANDERLAAN, Christopher, A. et al.; Lyon & Lyon LLP, 633 West Fifth Street, Suite 4700, Los Angeles, CA 90071 (US).

(81) Designated States *(national)*: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW.

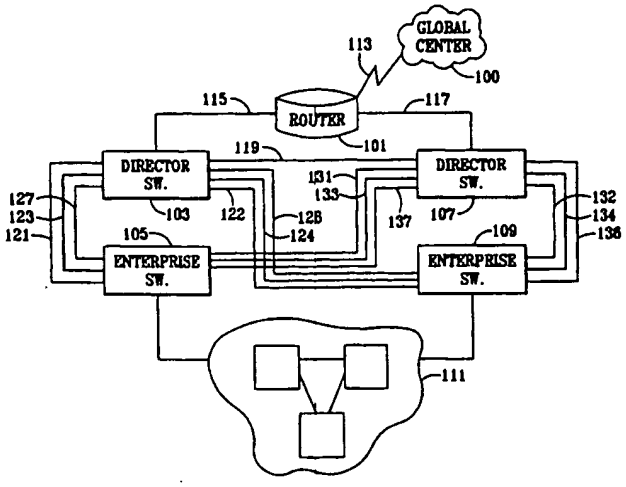
(84) Designated States *(regional)*: ARIPO patent (GH, GM, KE, LS, MW, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).

Published:
— *with international search report*

(88) Date of publication of the international search report:
27 September 2001

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: SYSTEM AND METHOD FOR FACILITATING COMMUNICATIONS OVER A DISTRIBUTED ELECTRONIC NETWORK



(57) Abstract: A system and method for facilitating communication over a global electronic network (e.g., the Internet) comprises a web site having a dynamic directory which stores the on-line status of registered users of the Internet, along with permanent communication numbers and current IP addresses for each registered user. A user seeking to establish communication with another registered user enters the target user's permanent communication number. If the target user is on-line, the requesting user receives the target user's current IP address from the directory, and instant or live communication then ensues. In the event that the target user is not on-line, the system will route the requesting user's message to video or voice mail for the target user. When the target user eventually comes on-line, the target user can retrieve messages from his or her mailbox. In one aspect, a system and method are provided for allowing either live or delayed communication to occur between users based upon whether the target user is on-line or off-line.

WO 00/69143 A3

INTERNATIONAL SEARCH REPORT

Inte ional Application No
PCT/US 00/12908

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 H04L29/12 H04L12/58

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 H04L H04M

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 98 45781 A (FLASH COMMUNICATIONS INC) 15 October 1998 (1998-10-15) page 4, line 12 -page 11, line 4 figures 1,2,5 ---	1-13, 21-24
X	WO 97 14234 A (NETSPEAK CORP) 17 April 1997 (1997-04-17) page 10, line 2 -page 11, line 23 page 14, line 5 - line 13 page 19, line 6 -page 20, line 2 figures 1-4,7,8 --- -/--	1-13, 21-24

[X] Further documents are listed in the continuation of box C.

[X] Patent family members are listed in annex.

° Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
9 January 2001	26.04.01

Name and mailing address of the ISA	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Eraso Helguera, J

2

Form PCT/ISA/210 (second sheet) (July 1992)

INTERNATIONAL SEARCH REPORT

Inte ional Application No
PCT/US 00/12908

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	ESCHENBURG A: "WO LAUFEN SIE DENN? ICQ HAELT VERBINDUNG ZU BEKANNTEN" CT MAGAZIN FUER COMPUTER TECHNIK,DE,VERLAG HEINZ HEISE GMBH., HANNOVER, no. 22, 26 October 1998 (1998-10-26), pages 92-95, XP000779803 ISSN: 0724-8679 the whole document	1-13, 21-24

2

INTERNATIONAL SEARCH REPORT

rnational application No.
PCT/US 00/12908

Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. [ ] Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. [ ] Claims Nos.:
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:

3. [ ] Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

1. [ ] As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.

2. [ ] As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.

3. [ ] As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:

4. [X] No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

1-13, 21-24

Remark on Protest

[ ] The additional search fees were accompanied by the applicant's protest.

[ ] No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

International Application No. PCT/US 00/12908

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

1. Claims: 1-13,21-24

A method, a system and a device for facilitating communication based on a permanent communication number.

2. Claims: 14-20

A method of providing assisted browsing.

INTERNATIONAL SEARCH REPORT

.nformation on patent family members

Inte ·ional Application No
PCT/US 00/12908

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 9845781 A	15-10-1998	US 5943478 A	24-08-1999
		EP 1023663 A	02-08-2000
WO 9714234 A	17-04-1997	US 6108704 A	22-08-2000
		AU 727702 B	21-12-2000
		AU 7247696 A	30-04-1997
		BR 9610980 A	15-06-1999
		CA 2231127 A	17-04-1997
		CN 1197567 A	28-10-1998
		EP 0852868 A	15-07-1998
		JP 11515148 T	21-12-1999
		US 6131121 A	10-10-2000
		US 6185184 B	06-02-2001
		US 6009469 A	28-12-1999